

# PCM

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## THE PORTABLE COMPUTING MAGAZINE

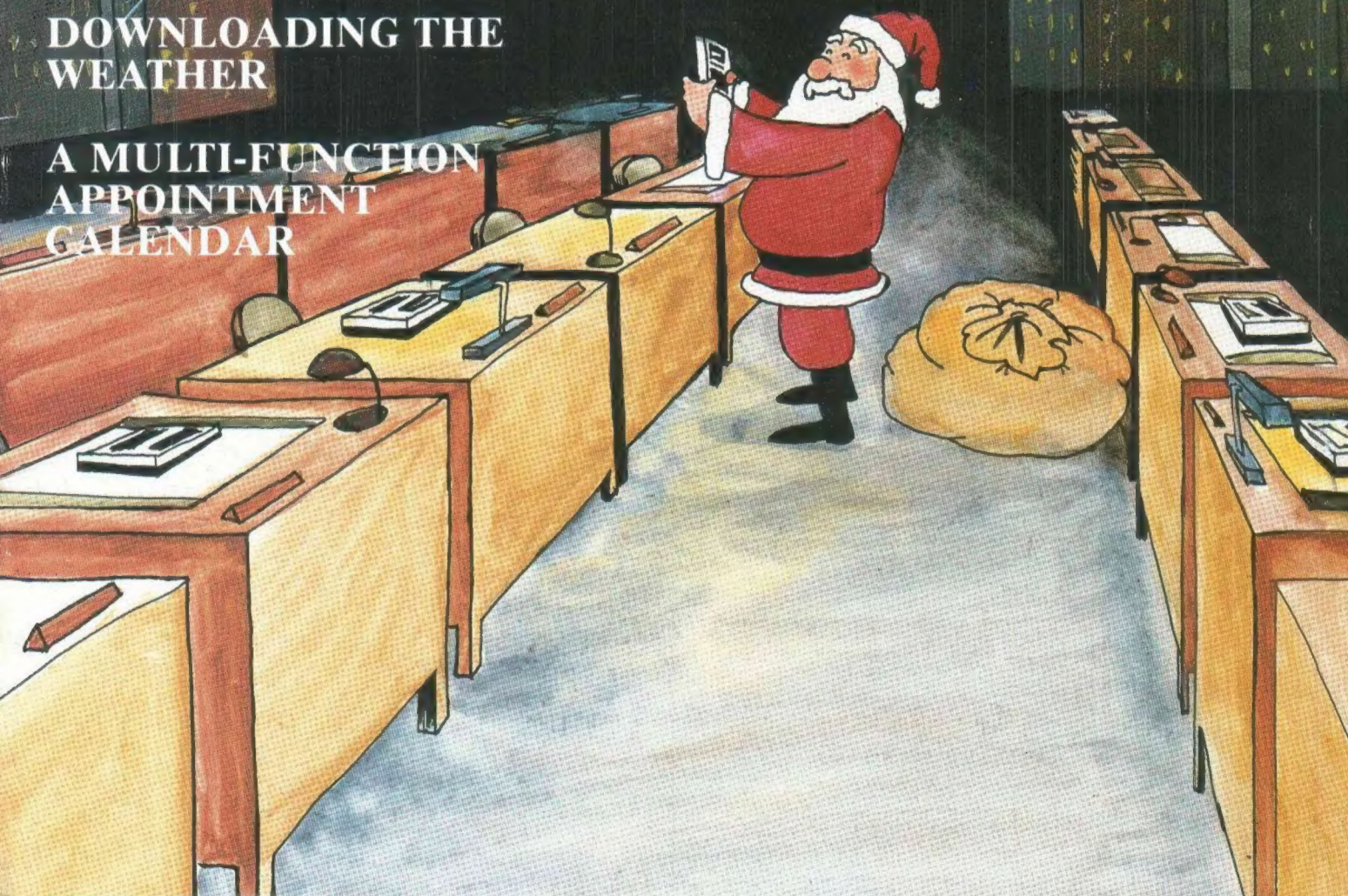
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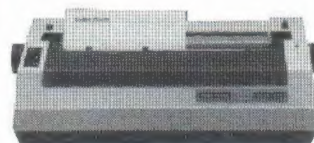
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## Sugarplums And Shakeouts: The Current State

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**H**ere we are, waiting for 1983 to become 1984, and, as is probably appropriate, there are some thoughts at this end as the old year begins to take shape toward the new.

Truth be it known, I really dislike people who somehow have the opportunity to write such things as editor's columns, pontificating about issues of all sorts. The truth of the matter is that we usually know less about the subject than most of you. And I am sure that, by and large, this is the case here. Nevertheless, I hope that some of what I have to say may give you a little insight as to what we here at *PCM* think about the "current state of the computer industry" (now there's a mouthful).

We have been "treated" to people saying for quite some time that a "shakeout" is due in the microcomputer world. We've essentially agreed with that, simply because there are too many machines out there, and too many poor ones, for the market to continue to support them all. When someone buys a microcomputer for \$1,700 out of the box that I know won't do what a \$399 computer will, it just stands to reason that a shakeout is coming.

Yet, there were lots of heads being scratched when Osborne admitted it was in trouble some months ago. Osborne, the darling of the protable computer world! Yet, for all practical purposes, Osborne showed no growth, no improvement, and no permanent reduction in price (that should have been very possible) from the time it first caught on until the bad news went forth.

Closer to home, similar announce-

ments have come from the Atari and Texas Instruments camps. If you want to analyze all of this, it is pretty easy to see that the machines were unrealistically priced (even when discounted) and short on features. And now, even from that bastion of computerdom, Cupertino, Calif., we hear things may not be well. After all, the Apple III was a disaster, LISA is not catching on and (to be honest) even Commodore has pretty well passed Apple by. If there's a shakeout, the Apple may not fall too far from the tree.

Let's if we may, contrast all this a moment to the news that greeted me (as a Tandy stockholder) in a very attractive annual report that landed on my desk a few weeks ago. (You'll be pleased to know that Tandy's annual report cover was a reproduction of the Portable Computer, embossed and in full color). In contrast to its competition, Tandy reported a substantial 24 percent increase in earnings for the fiscal year. We understand a great deal of that was due to computer sales.

What does this all mean, aside from the fact that the people who work in Tandy Center certainly know what they're doing? What I think it means is two things, both of them very important to you as an owner of a TRS-80 Portable Computer.

First of all, it means that your computer system is going to be here to stay. That's certainly good news. It is, because it means increased support from the manufacturer (Radio Shack), ability to get repairs made and availability of

more things that will work with your Model 100. I realize that you can easily buy a TI Home Computer for less than \$50. But what happens 60 days from now when the thing goes on the blink? I mean, they won't be making that computer any more.

Second of all, it means that you can count on increasing support from outside vendors for products that will further enhance your Portable Computer. Over the next six months, how many people do you suppose will be introducing new products for the Osborne? Not too many. Yet, with a growing (and profitable) system like the PoCo, I suspect you will see more and more firms offering more and more things in this marketplace.

All of that simply bodes well for you and for your Portable Computer. And what it means is simply that even if you don't have money invested in Tandy Corp., you profit by the good management the company enjoys. It is a nice thought for a new year.

Another trend that we see for the future is more and more of what is being called "bundled" software. And, to some degree, we see it as a mixed blessing.

Remember, your Portable Computer came with a "word processor," a couple of "database managers," and a "terminal program." I don't want to knock these programs, which are good as far as they go, but I do think that it is important to make some comments on the idea of "bundling" software with a computer.

(*LPRINT* continued on Page 37)



# Letters



## MORE FROM MIKE

Editor:

I just received my October issue of *PCM*. Before I disappear for the evening behind its covers, let me say how much I appreciate to see the incorporation of many of the points I have recently written about — regarding earlier issues namely:

- 1) A professional, business-like cover;
- 2) Use of "M-100" instead of that generalized (and childish) "PoCo;"
- 3) BASIC Bytes — for starters; and
- 4) Less games and frivolities.

You are doing a great job of developing further use and understanding of the M100 — and as you seem to listen so well, I have a few more suggestions!

Monthly cover photos could each represent new, serious uses of the M100; for examples, aviation, architecture, engineering, hospitals, shipping, etc.

When you print a program such as on Page 34 — could you devise a code such as a small [8], to indicate how many spaces are required before entering text after quotation marks? It would save so much time (and errors) trying to count spaces to make a good screen or printer layout. *Rainbow* programs for CoCo should use the same code. For the print FORMAT program, Lines 30 to 80 would read: 30 [4]: 40 [9]: 50 [12]: 60 [12]: 70 [12]: 80 [12]. Try to count your

spaces without any 'stars' on Line 20! Keep a regular page or two of "Letters"—each with Editors or 'expert' comment . . . we learn a lot from each other like this. Thanks again.

Keep expanding the "Reviews." Regards.

Mike Walters

Tracy, P.Q., Canada

## INFORMATION PLEASE

Editor:

The LPRINT section of *PCM* asked for comments about subscriber's interests. My principal use of the 100 is as a communication tool and word processing. I have not yet been able to work past all the "bugs" or my inept use of the 100, but I have no question of its ultimate usefulness to me. The points on which I would like information are:

1) I have had three lock ups that were so serious that I had to revert to a cold start in order to use it again. The third lock up was not released by a cold start, it was partially released by a (CTRL/PAUSE) and holding RESET. Even after this drastic step, the internal modem would not connect to another computer. I returned the 100 on warranty and by the time they returned it, it had corrected itself.

2) I want to get a better word processing capability than the 100 offers. It is remarkably similar to the Color Scriptor in function. I have a CoCo and use the Nelson *Super Color Writer* as a word processor. This program runs circles around anything that RS has provided. I would like to have a similar program in the 100. If I could, effectively, interconnect the CoCo and the 100, it would be tremendously helpful.

3) My concern about the word processor carries over to control of the printer. I have a RS Line Printer VIII, but the only control that the 100 exerts over this printer is the length of the lines. Again, a program with the capabilities of the *Super Color Writer* would be extremely valuable.

This letter is being composed on a CoCo and printed on an RS Line Printer VIII. I

would like to be able to make a direct connection between the two, but so far I have been unable to achieve that. In fairness to RS, I must say that I have not been able to spend very much time on it, but at the same time, the amount of information provided is totally inadequate to achieve this connection. I have had good success in accessing the office computer by telephone.

Any information that *PCM* can provide on these subjects would be appreciated.

David E. Schlegel  
Moraga, CA

## Editor's Note:

The *Businesspak+* by PCSC will solve your printer formatting problems. To communicate between the CoCo and Model 100, all you need is software for the CoCo, such as *Super Color Terminal* and a cable described in *PCM* — August 1983 Page 9.

## BATTERY BUG

Editor:

First let me congratulate you on a wonderful magazine; it is very informative. Secondly, a comment about SAVEing things on tape with the M100. When I first tried SAVEing a text file, I kept getting errors that I never had experienced before while working with my husband's CoCo. After several frustrating hours working with M100 and the manual, my husband suggested that I work with both the tape player and M100 on batteries. I tried both on batteries all around and ta-daa!! it worked. The manual does not mention anything about this situation coming up, so I thought that this information might be of use to all those M100 users out there.

Also, congratulations on a great *Rainbowfest* in Fort Worth! As I mentioned, we do have a CoCo as well as my M100. Next question is when and where will the first M100fest be?

Kerri Arnold  
Dallas, Texas

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# Program Control

By Richard A. White  
PCM Contributing Editor

**P**rogram control is nothing more than decision making and then taking appropriate actions after the decision. To make a decision, the program must make some sort of test. The result of any single test a computer makes is either a true or a false answer. Remember, it's a binary beast even when talking BASIC. If you had only IF/THEN in your BASIC you still could write any program you wanted. Other control statements like FOR/TO/NEXT, ELSE, ON/GOSUB and ON/GOTO provide for simplicity, speed and efficient use of memory. In this article, we will compare them and suggest ways to use them that you may not have thought about.

IF A=B THEN 100. This is perhaps the simplest of statements—it means just about what it says. IF A=B GOTO 100 is also acceptable BASIC and means the same thing. The 100 refers to Line 100 in either case. If A does not equal B then go to a subroutine, then write IF A=B THEN GOSUB 1000 works also but why keep the unneeded THEN around to take up memory space.

Any group of statements and functions may follow a THEN. For example, IF A=B THEN CLS : PRINT A\$ A : SOUND 100,10 : GOTO 100. For the actions following the THEN to take place it must be TRUE that A=B. When

it is FALSE that A=B, you will want some other action. With ELSE, this action can be placed in the same line of code. In most cases this leads to program clarity and simplicity. Our example is IF A=B THEN CLS : PRINT A\$ A : SOUND 100,10 : GOTO 100 ELSE CLS:PRINT"NOTEQUAL":SOUND 50,10. Note that colons are NOT used on either side of THEN and ELSE. If you want to waste memory you can put them in—they will do nothing else for you. The ability that ELSE gives you to choose one piece of code or another is extremely powerful. Without ELSE you would be reduced to using IF/THEN mainly to route the program to lines where the needed code would be placed rather than executing the code directly. This of necessity would locate the code remote from the text calling it. Program clarity is significantly reduced, speed is reduced and memory usage is increased. Instances when you will want to branch to remote lines are when you are going to major program routines or are going to subroutines used by other portions of your program.

IF/THENs can be nested, that is one following another in the same line with or without intervening code. Following are some lines to help show the relationships of the keywords to one another.

```
IF (Test 1) THEN (if Test 1 is true)
  IF (Test 2) THEN (if Test 2 is true
    ACTION A)
  ELSE (if Test 2 is false ACTION
    B)
ELSE (if Test 1 is false ACTION C).
```

The second IF is inset under the first THEN that it follows. Each ELSE is placed under the IF that refers to it. An ELSE will be related to the closest IF

that does not have an ELSE. If the ELSE under the second IF were removed, then the remaining ELSE would automatically be associated with that IF even though it is followed by code relating to the first IF. If you had no ACTION B in the event that Test 2 is False, put the ELSE in anyway so that ACTION C will occur when Test 1 is false.

```
IF (Test 1) THEN (if Test 1 is true)
  IF (Test 2) THEN (if Test 2 is true
    ACTION A)
  ELSE
    ELSE (if Test 1 is false ACTION C).
```

You can test for many things after an IF. These include A less than B ( $A < B$ ), A less than or equal B ( $A \leq B$ ), A not equal B ( $A \neq B$ ), A greater than B ( $A > B$ ), or A greater than or equal B ( $A \geq B$ ). Of course, both sides need not be variables.  $A > 0$ , or  $B = 5$  are quite acceptable. You can do the same tests on strings like  $A\$ = \text{"GOLIATH"}$  or  $A\$ > \text{"DAVID"}$ . Let's assume that  $A\$ = \text{"GOLIATH"}$ . You might agree that  $A\$ > \text{"DAVID"}$  is TRUE since GOLIATH is a somewhat larger man than DAVID. Others might point out that David killed Goliath and in that sense  $A\$ > \text{"DAVID"}$  is FALSE. Your Model 100 could care less about this hogwash and looks only at the ASCII values for "G" and "D." In ASCII terms, "D" is 68, "G" is 71, 71 is bigger than 68. The matter is settled right there and "GOLIATH" is greater than "DAVID." If PoCo had to choose between "GOLIATH" and "GRASS," it would go on to the second letter to find a separation.

Up to now things have been straightforward in that one test was made and one or another action taken depending on whether that test proved true or

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*Dick White has been programming in BASIC for over three years, and has a number of programs on the market for the Color Computer. He is also a columnist for the Rainbow, PCM's sister publication, and is a member of CINTUG, the Cincinnati TRS-80 Users' Group*



false. Real life, even in a computer, is that a number of conditions need be met for some action to take place. IF I can find \$1000 AND convince my wife that it is necessary, THEN I will buy a MODEL 100. Well, those who wrote our BASIC saw to it that we would have ways to make decisions based on a number of test. We have already discussed one way. IF (Test 1) THEN IF (Test 2) THEN (Action). Alternately, this can be written IF (Test 1) AND (Test 2) THEN (Action). In BASIC this might be IF A = B AND A\$ > "DAVID" THEN PRINT "SUBSCRIBE TO PCM Magazine". To muddy the waters more, even this will work: IF A = B AND A\$ > "DAVID" OR C > 28 THEN PRINT "SUBSCRIBE TO PCM Magazine". See the OR? If C were the contents of your bank account and it were greater than \$28 then the message "SUBSCRIBE TO PCM Magazine" would be printed irrespective of whether A = B or GOLIATH is greater than DAVID. Tests can be strung together with AND and OR in almost any conceivable way, which makes them powerful tools in the programmer's bag of tricks.

As noted, IF/THEN/ELSE can do all program control. So why use FOR/TO/NEXT? It's easier. All you and the program need to know about the loop are right up there in the line heading up the loop. FOR/TO/NEXT is faster since BASIC knows up front what you want and can use the most efficient machine language coding to get it done. In the IF/THEN approach above, the BASIC interpreter never knows it is doing loops. Here is the basic syntax of FOR/TO/STEP/NEXT.

```
FOR (variable & initial value) TO
  (limit value) STEP (value)
```

```
NEXT
```

The initial value, limit value and step value may be positive, negative, integer or decimal. Looping continues as long as the variable remains less than (or more than) the limit value. Any of the following are valid.

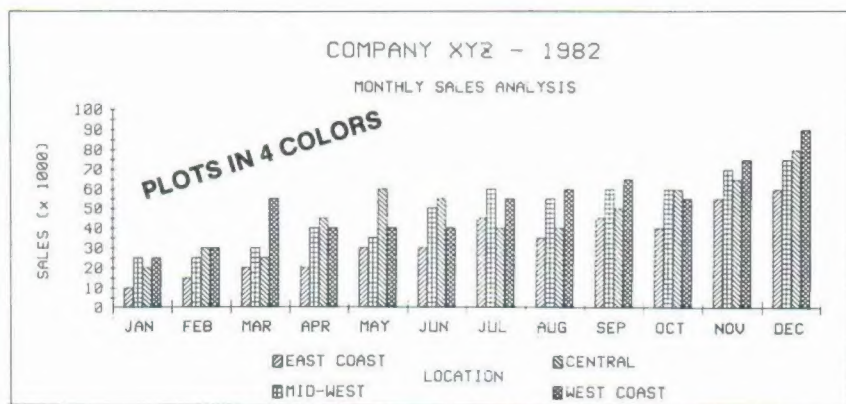
```
FOR C = 1 TO 10 ... NEXT
FOR C = 132.769 TO 133.543 STEP
```

```
.008 ... NEXT
FOR C = 1000 TO -732 STEP -200 ...
NEXT
FOR C = -1 TO -10 STEP -1 ...
NEXT
FOR C = 1E1 TO 1E35 STEP 9E10 ...
NEXT
FOR C = 0 TO 0 ... NEXT
```

Without STEP, BASIC assumed an increment of +1, which is a very typical case. Otherwise there is nothing special about STEPing. Just make sure you STEP in the right direction to get from the initial value to the limit one. No matter what the values assigned, a FOR/TO/NEXT loop is always executed at least once. It is necessary for the program to get to NEXT before any test is made. In some listings, you will see the variable name after NEXT like NEXT C. No you don't see it above. The computer knows full well which variable it is dealing with and doesn't need the programmer telling it. From a programming clarity viewpoint a case can be made for documenting the NEXT with its associated variable. And some people feel strongly that good programming structure requires that variables

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be associated with NEXTs if some letters to editors are to be believed. I feel that if your other programming practices are sound, variables after NEXTs are a pain and waste of bytes.

BASIC stores the location of the start of the FOR/TO/NEXT loop on the microprocessor's stack in memory. When the program exits normally, these memory locations are cleared for other uses. When a FOR/TO/NEXT loop is abnormally exited, these memory locations are not cleared. There are occasions when early departure from a loop is needed. There are a number of ways to do this. When this is done, there should be code to set the count variable to a number equal or higher than the limit value and follow this with a NEXT in order to clear the stack. Here is an example.

```
100 FOR C = 0 TO X : IF Y > Z
    THEN C=X: NEXT: GOTO 200
110 ' CODE IN THE LOOP
120 NEXT
130 ' CODE FOLLOWING THE
    LOOP
```

There are times when it is not desirable to go through the loop even once. In our BASIC you must test the governing condition and jump around the FOR/TO/NEXT code or abandon FOR/TO/NEXT writing your own loop control with IF/THEN. Here is one approach.

```
100 A = 1
105 IF A > X GOTO 150
110 ' LOOP CODE
.
.
.
140 A=A+1:GOTO 105
```

One reason to need to do this would be if you were taking a series of strings apart, perhaps for printing fields of records. If the user had put no data in yet and X = 0, but made the mistake of trying to print, a SN Error would greet their efforts as soon as the program tried to take an empty string apart. Now, no programmer wants a user to be greeted with an SN Error—*ever*. So constructions like the above are necessary now and then. Some languages and dialects provide alternate statements like DO/UNTIL that test first and then act. What is most important is to know what the characteristics of your language are and use them to best advantage. The grass may look greener over

the PASCAL fence. That does not mean its better grass. And while we are at it, you should be aware that the same keywords may act differently in another language. IF/THEN/ELSE seems to be one of the few constants.

Two other program control statements in Model 100 BASIC are ON Z GOSUB and ON Z GOTO. Z is a number starting with 1 which tells the computer to count to a specific line number listed after the GOSUB or GOTO and go to that line. Here is some code from an editor program for an example of a super use of ON/GOSUB.

```
60 INPUT C$
80 B=INSTR(1, "NnIiTtDdFfEeXx
    RrLlPpGgCcUu2Kk A",C$)
90 ON B GOSUB 370, 370, 410, 410,
    450, 450, 460, 460, 470, 470, 540,
    540, 620, 620, 640, 640, 650, 650,
    720, 720, 780, 780, 870, 870, 1140,
    1140, 1160, 1200, 1200, 1300, 225
215 IFC$="M"ORC$="m"THENK$=
    TX$(CL):GOSUB620
220 RETURN
```

This code does the same thing as a series of IF/THEN lines like we discussed before, but does it in one third the time. Further, it uses half the number of bytes that a series of IF/THEN statements does. The INSTR statement in Line 80 hunts through the string of characters trying to find a match for the character in C\$. If it finds a match, the test is successful and it puts the count up the string in B. In ON B GOSUB, the computer counts up line numbers to the number in B and makes a subroutine call to that line number. Obviously the INSTR-ON B . . . technique is quite effective here. If you only had three or four characters or values to test, IF/THEN would be preferred.

The five interrupt definition commands are variations of ON/ GOSUB and ON/ GOTO. Unfortunately, you don't have a choice of GOTO or GOSUB, but must use the form associated with the particular interrupt. For example, ON KEY GOSUB . . . calls a numbered subroutine depending on which key is pressed. You need enable only those keys you wish to use. At first glance this would seem great to use for making menu choices. When you want to choose one program function or another and can conveniently put the code modules up as subroutines, this is the best way to go. However, if you want to use the function keys to enter choices within a module, you may have troubles.

Here is a neat little cul-de-sac you might get into. Your program is sent off to an input module using a function key. You would like to have one of the function keys defined as a return to send the program back from the subroutine. You cannot use ON KEY GOSUB to send the program to a line with a RETURN since the RETURN will send you right back to the place where you were when the function key was pressed. So, why not send the program to the start-of-menu line and forget about a RETURN. You could do this using the GOSUB like a GOTO for a while. After a GOSUB call, how does the computer know where to return? It stored where it was in the program in a RAM area called the stack before it went to the subroutine. If you do not use a RETURN, the return address stays on the stack. If you use a bunch of GOSUBs without RETURNS, return addresses keep building up in the stack. The only way to clear the stack is to use a RETURN. Taken to the extreme, the program will run out of memory and crash.

I have not found a way out of this box. For now, ON KEY GOSUB must be used for subroutine calls only where you want to return to the line where you were when the function key was pressed. Here is a sample of code.

```
1000 CLS: ON KEY GOSUB 100,
    200, 300, 400,,800
1005 KEY (1) ON: KEY (2) ON: KEY
    (3) ON: KEY (4) ON: KEY (7)
    ON
1010 PRINT@0,"MENU CHOICES..."
1020 GOTO 1010
```

Line 1000 defines which subroutines refer to which function keys. Note that keys one through four have lines to go to, five and six don't so they are undefined. Key seven is defined while key eight is not. In Line 1005, these keys are turned on. Keys and other interrupts are turned off when a BASIC program is run. KEY ON turns all keys on while KEY OFF turns them all off. Line 1010 prints the numbered choices to the screen in a format of your choice. The program then loops, continually printing the menu until an active function key is pressed. This sends it to the subroutine starting at the listed line number. When the subroutine's work is completed, use a CLS: RETURN to clear the screen and return the program into the menu loop.

The MDM, modem and TIMES\$ interrupts work in the same way except the source of the interrupt is either data



received over the modem or the computer clock equalling a time set in a string. What might these be good for? Why not an alarm clock program? Here is how you could write the program in conventional BASIC, ie without the interrupt.

```
10 CLS: PRINT@0,TIMES
20 PRINT"ENTER WAKEUP TIME
   IN FORM 06:30:00: INPUT
   WAKEUP$
30 CLS: POWER CONT
40 PRINT@ 0,TIMES: IF TIMES
   =WAKEUP$ THEN 50 ELSE 40
50 POWER 100
60 PRINT@0, TIMES: SOUND
   9394,20: SOUND 4697,20: GO
   TO60
```

The screen is cleared, current time printed and then the program asks for the wakeup time. Note this must be in the format specified. In Line 30 we give a POWER CONT to keep the computer from automatically turning off. If you do use this as an alarm, you had better be running PoCo off your adapter. Line 40 turns PoCo into a clock, continuously updating the time and checking to see if the time equals the wakeup time

entered. When a match is obtained, the program goes to Line 50 to reset the POWER off delay and then to Line 60 to sound the alarm. The user uses the pause/break key to stop the alarm.

Below is the same program using the TIMES\$ interrupt. The IF/THEN/ELSE statement in Line 40 has been replaced by the ON TIMES\$ . . . GOSUB and TIMES\$ ON in Line 30. The program loops in Line 40 until TIMES\$=WAKEUP\$ and then goes to the subroutine starting in Line 50.

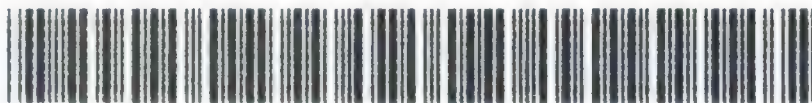
The only real difference is that the interrupt is active while the program is off in other lines of the program. It's an always-there IF/THEN.

```
10 CLS: PRINT@0,TIMES
20 PRINT"ENTER WAKEUP TIME
   IN FORM 06:30:00: INPUT
   WAKEUP$
30 CLS:POWER CONT: ON TIME
   $=WAKEUP$ GOSUB 50:
   TIMES$ ON
40 PRINT@0,TIMES: GOTO40
50 POWER 100
60 PRINT@0,TIMES: SOUND
   9394,20: SOUND 4697,20:
   GOTO60
```

I will not go into the ON MDM/ GOSUB routine other than to suggest that someone write a two-computer game where the computers are continually updating each other over the phone. Everything you need is there in PoCo BASIC. Likewise, I will pass for now on ON ERROR GOTO. This is over long already.

To summarize, program control is accomplished with statements that perform one or more tests and take actions based on whether true or false results are obtained for each test. What action takes place depends on how the programmer writes the statements. The control tools in Model 100 BASIC are IF/THEN/ELSE, FOR/TO/STEP/ NEXT, ON GOTO and ON GOSUB and the interrupt routines. IF/THEN /ELSE is extremely powerful and could be used alone without seriously limiting one's ability to write complex programs. The other statements provide for program clarity, speed and economy of memory. Each has its place, so serious programmers learn to use each to best advantage through in-depth understanding of each.

PCM



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# A Time to Take Stock

By Robert Frowenfeld  
PCM Contributing Editor



Well, it's that time of year again—December. And while most of us spend the month of December wondering what Santa is going to drop down our chimney, there are lots of folks out there in *PCM* land that look at the *end* of the year as the *beginning* of getting their paperwork in order for the Tax Man. If you engage in the ups and downs of Wall Street, you are inevitably bombarded with a deluge of transaction slips from your various buy and sell orders. Moreover, keeping track of which stocks you own or have bought or sold during the course of the year can sometimes be an onerous task indeed, and although April 15 is a long way off, there's no better time than the present to get our capital gains (and losses) in order. Our *On The Road* program this month will let you keep track of all your stock purchases and sales and, at the same time, keep a permanent record of your stock portfolio.

The name I have given to this program is *PORT.BA*, which is short for *PORTfolio*. I like it because it simplifies my record keeping while it lets me keep track of my investments whenever I'm out of town. But where it really shines is when it comes time to analyze my profits (and alas!) losses at the end of the year.

So let's get started! When you run *PORT*, the main menu lists the various functions available (see Figure 1). These functions permit you to: enter a stock transaction, display your trading activity in a particular security, and display your current position for any one, or all stocks in your portfolio.

The first function, Enter Transaction, is the key to this program. By maintaining a database of all stock purchases and sales, your portable companion can instantly provide you with the information you need about your investments. Incidentally, *PORT* uses a data file named "PORT.DO" to maintain all your stock trades. By using a document file, you can (if you so desire) edit this file by using the *TEXT* program supplied with your Model 100. Therefore, if you should ever discover that you have made an error in a transaction entry, making the necessary corrections should be a simple matter.

Referring to Figure 2, we see that *PORT* maintains the following information for each security's trade: date, stock ID, number of shares traded, price per share, whether the trade is a buy or sell transaction, and the brokerage commission incurred. Figure 3 shows how your screen would look for a purchase of 200 shares of Tandy Corporation stock at a price of  $35\frac{1}{2}$  and a commission of \$50; note the Stock ID symbol is TAN—this is the New York Stock Exchange symbol for Tandy Corporation. When telling your Model 100 that the trade is a purchase, you must respond with a "B" for buy or, for a sale, and "S." Also, you must be sure to enter the Stock ID in uppercase, or *PORT* will not accept it as valid data.

Once you have completed the transaction input, you are prompted to acknowledge that this is a correct entry. Review your typed input, and if it is not correct, enter an "N" and *PORT* will allow you to start over. If everything is okay, type

a "Y" and the transaction will be recorded. Keeping track of the trade date is very important because when it comes time to sell your stock, you will have to know whether the gain (or loss) is long term or short term. For those of you who aren't aware of this significance, a short explanation is in order.

As you know, a capital gain becomes *long term* if held a year and a day. The end of the year can provide some money-making opportunities if you are trying to minimize your tax liability. Therefore, knowing which stocks you own (and when you purchased them) is an absolute necessity. For example, if you have already made some money this year in the stock market and you want to reduce your income taxes, the smart play is to sell a security that you own that has lost money, preferably one that you have held less than a year. By utilizing the second function of *PORT* (as we'll see in a moment), we can easily keep track of the purchase (and sale dates) of any security.

After the entry of a transaction, *PORT* will clear the screen and make itself ready for another entry. If there are no more entries to be made, simply press the "F1" function key in the extreme upper-left of your keyboard—that will return you to the main menu.

The second function of *PORT*, Individual Stock Activity, allows you to display all activity for a particular stock. As with the Enter Transaction function, you must enter the stock symbol in uppercase. Figure 4 is a display of a sample *PORT.DO* data file. Let's say we wanted a complete listing of all trans-



actions for IBM. After typing in the stock symbol IBM, PORT asks if the information is to be sent to an attached printer. If we were to respond with an "N," then the output is sent only to the display, conveniently pausing every five entries so we can review the activity. Each line of output lists

Figure 1

### Stock Portfolio Manager

- 1 Enter Transaction
- 2 Individual Stock Activity
- 3 Open Position
- 4 End Program

Figure 2

### Enter Transaction

Date : Buy / Sell:  
 Stock ID : Commission:  
 Shares :  
 Price/Shr :

Press F1 to Exit

Figure 3

### Enter Transaction

Date : 10/31/83 Buy / Sell: B  
 Stock ID : TAN Commission: 50.00  
 Shares : 200  
 Price/Shr : 35.5

Entry Correct (Y/N):

Figure 4

### Listing of file "PORT.DO"

```
"1/5/83","B","IBM", 100 95.75 25
"3/18/83","B","TAN", 200 45 32.5
"3/29/83","B","LIL", 300 15.875 56.75

"4/15/83","B","IBM", 100 105.5 37
"5/25/83","S","IBM", 100 110.25 25
"6/13/83","B","T", 200 62.75 42.65
"8/24/83","S","DEC", 400 105 153.80
"10/31/83","B","TAN", 200 35.5 50
```

Figure 5

### Stock: IBM

Date	Buy/Sell	Shares	\$/Share	Comm.
6"1/5/83	Bought	100.00	95.750	25.00
4/15/83	Bought	100.00	105.500	37.00
5/25/83	Sold	100.00	110.250	25.00

Total: 3 Transactions  
 100 Shares LONG

Figure 6

Stock	Shares	Pos.	Stock	Shares	Pos.
IBM	100	Long	TAN	400	Long
LIL	300	Long	T	200	Long
DEC	400	Short			

the trade date, whether the trade was a purchase or a sale, the number of shares bought (or sold), the price per share, and the commission. If "Y" is entered in response to the printer query, then the output also goes to the printer without pausing (see Figure 5). At the end of the listing (whether printed output is requested or not), PORT lets us know the total number of transactions in the database and if the position is long or short. When you own a stock, you have a *long* position. If you think a stock is going to go down, then you might sell the stock without actually owning it, hoping to buy it back later at a lower price. In that instance, you have a *short* position in the stock.

Once the listing of the transactions is completed, you are requested to enter another stock symbol. Here, as before, pressing the "F1" key will return you to the main menu.

The last function of PORT allows you to instantly find your open position (long or short) for a particular stock. As with the Individual Stock Activity function, this one requires only that you type in the stock symbol. PORT then quickly looks at all your transactions and determines how many shares of stock you own (or are short). A real handy feature of this function is the ability to display (or list) the position of *all* securities on file. When prompted to enter the stock symbol, a response of an asterisk (\*) will cause all security positions to be displayed. Additionally, there is an option to send the output to the printer (see Figure 6). If no printed output is desired, then PORT will again conveniently pause after the screen is filled so you can review the information.

Well, there you have it, a nice little Christmas (or Hanukkah) present for all you Wall Street money moguls. May the new year bring you the bullish profits that only your Portable Computer can record!



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The listing:

```

1 CLEAR 1000:DEFINT I-N:DEFSTR A,R,U
2 BL$=STRING$(38," ")
3 ES$=CHR$(27):R=ES$+"p":U=ES$+"q":GOTO
35
4 LINEINPUT IN$:X=VAL(IN$):IF IN$<>" " TH
EN Y=ASC(IN$):RETURN ELSE RETURN
35 DIM A(100),X(100)
40 FI$="PORT.DO"
50 DATA"Enter Transaction","Individual S
tock Activity","Open Position","End Prog
ram"
51 FOR I=1 TO 4:READ M0$(I):NEXT I
60 KEY 1," "+CHR$(13)
70 H1$=" Date Buy/Sell Shares $/Shar
e Comm.
71 G1$="\ \ \ #####.## ###.##
# ###.##
72 H2$="Stock Shares Pos.
73 G2$="\ \ #####
74 H3$="-----
75 H4$="-----
-----
100 CLS:PRINT@9,"Stock Portfolio Manager
"
105 CLOSE
110 FOR I=1 TO 4:PRINT@45+I*40,R;I;U" "M
0$(I);:NEXT I
115 PRINT@289,"Select: ";
120 A=INPUT$(1):FX=VAL(A):IF FX<1 OR FX>
4 THEN 120
130 ON FX GOTO 1000,2000,3000,4000
200 CLS:J=LEN(M0$(FX)):PRINTTAB(20-J/2);
M0$(FX):RETURN
300 OPEN FI$ FOR INPUT AS 1:RETURN
400 PRINT@290,"Press "R" F1 "U" to Exit"
:RETURN
500 PRINT
510 PRINT@286,"Press any key to continue
: ";A=INPUT$(1):RETURN
600 'heading
610 CLS:PRINTH2$;H2$;:PRINT@40,H3$;H3$;P
RINT@80,"";:IF PR$="Y" THEN LPRINT H2$;H
2$;LPRINT H3$;H3$
620 RETURN
700 'all stocks
703 PR$="N":PRINT@208,"Send to printer (
Y/N): ";A=INPUT$(1):PRINT@200,BL$;:IF A
="N" OR A="n" THEN 705 ELSE IF A="Y" OR A
="y" THEN 704 ELSE 703
704 PR$="Y"
705 IX=0
710 IF EOF(1) THEN 770
720 INPUT#1,DT$,BS$,ID$,SH,PR,CM
730 IF IX=0 THEN 745
740 FOR I=1 TO IX:IF A(I)=ID$ THEN J=I:G
OTO 755 ELSE NEXT I
745 IX=IX+1
750 A(IX)=ID$:J=IX
755 IF BS$="B" THEN X(J)=X(J)+SH ELSE X(
J)=X(J)-SH

```

```

760 GOTO 710
770 GOSUB 600
780 FOR I=1 TO IX STEP 2:PRINT USING 62$
;A(I);ABS(X(I));:IF PR$="Y" THEN LPRINT
USING 62$;A(I);ABS(X(I));
782 A="None":IF X(I)<0 THEN A="Short" EL
SE IF X(I)>0 THEN A="Long"
785 PRINT USING" \ \";A;:PRINT TAB(20
);:IF PR$="Y" THEN LPRINT USING" \ \
";A;:LPRINT TAB(20);
790 IF I=IX THEN 798
792 PRINT USING 62$;A(I+1);ABS(X(I+1));:
IF PR$="Y" THEN LPRINT USING 62$;A(I+1);
ABS(X(I+1));
793 A="None":IF X(I+1)<0 THEN A="Short"
ELSE IF X(I+1)>0 THEN A="Long"
794 PRINT" A:IF PR$="Y" THEN LPRINT" "A
795 IF INT((I+1)/8)*8=I+1 AND I+1<IX AND
PR$<>"Y" THEN GOSUB 500:GOSUB 600
797 NEXT I
798 IF PR$="Y" THEN LPRINT CHR$(12)
799 GOSUB 500:GOTO 100
1000 'enter transaction
1005 CLOSE:OPEN FI$ FOR APPEND AS 1
1010 GOSUB 200
1020 PRINT@080,"Date :";TAB(22)"Buy
/ Sell:";
1030 PRINT@120,"Stock ID :";
1035 PRINT@142,"Commission:";
1040 PRINT@160,"Shares :";
1050 PRINT@200,"Price/Shr :";
1060 GOSUB 400
1100 PRINT@92,"";:GOSUB 6:IF Y=32 THEN 1
00 ELSE IF LEN(IN$)<6 THEN 1100 ELSE DT$
=IN$:PRINT@280,BL$;
1110 PRINT@114,"";:IN$=INPUT$(1):IF IN$=
"" THEN 1110 ELSE Y=ASC(IN$):IF Y=32 THE
N 1110 ELSE IF IN$<>"B" AND IN$<>"b" AND
IN$<>"S" AND IN$<>"s" THEN 1110 ELSE BS
$=IN$
1115 IF IN$="b" THEN BS$="B" ELSE IF IN$
="s" THEN BS$="S"
1117 PRINT IN$;
1120 PRINT@132,"";:GOSUB 6:IF Y<65 OR Y>
90 THEN 1120 ELSE ID$=IN$
1130 PRINT@172,"";:GOSUB 6:IF X<0 THEN 1
130 ELSE SH=X
1140 PRINT@212,"";:GOSUB 6:IF X<0 THEN 1
140 ELSE PR=X
1150 PRINT@153,"";:GOSUB 6:IF IN$="" THE
N 1150 ELSE CM=X
1160 PRINT@288,"Entry Correct (Y/N): ";:
IN$=INPUT$(1):IF IN$="N" OR IN$="n" THEN
1000 ELSE IF IN$<>"Y" AND IN$<>"y" THEN
1160 ELSE PRINT IN$;
1170 PRINT#1,CHR$(34)DT$CHR$(34),"CHR$(
34)BS$CHR$(34)","CHR$(34)ID$CHR$(34)","S
H;PR;CM
1180 GOTO 1000
2000 'individual activity

```



```

2010 GOSUB 200:GOSUB 300:GOSUB 400
2020 PRINT@127,"Enter Stock Symbol: ";:G
OSUB 6:IF IN$="" THEN 2020 ELSE IF Y=32
THEN 100 ELSE IF Y<65 OR Y>90 THEN 2020
2025 PR$="N":PRINT@200,"Send to printer
(Y/N): ";:A=INPUT$(1):PRINT@200,BL$;:IF
A="N" OR A="n" THEN 2030 ELSE IF A="Y" O
R A="y" THEN 2027 ELSE 2025
2027 PR$="Y"
2030 CLS:PRINT H1$;H4$;:IF PR$="Y" THEN
LPRINT TAB(15)"Stock: "IN$:LPRINT:LPRINT
H1$:LPRINT H4$
2035 LC=0:N=0:TS=0
2040 IF EOF(1) THEN 2090
2050 INPUT#1,DT$,BS$,ID$,SH,PR,CM:IF ID$
<>IN$ THEN 2040
2060 IF BS$="B" THEN BS$="Bought":TS=TS+
SH ELSE BS$="Sold":TS=TS-SH
2070 PRINT USING G1$;DT$;BS$;SH;PR;CM;:N
=N+1:IF PR$="Y" THEN LPRINT USING G1$;DT
D$;BS$;SH;PR;CM
2075 LC=LC+1:IF LC=5 AND PR$<>"Y" THEN G
OSUB 510:CLS:PRINT H1$;H4$;:LC=0
2080 GOTO 2040
2090 PRINT:PRINT"Total:"N"Transactions"
2091 IF PR$="Y" THEN LPRINT:LPRINT"Total
:"N"Transactions"
2092 A="LONG":IF TS<0 THEN A="SHORT"
2094 PRINT TAB(6);:IF TS=0 THEN PRINT" N

```

```

o Position":GOTO 2095 ELSE PRINT ABS(TS)
"Shares "A
2095 IF PR$<>"Y" THEN 2096 ELSE LPRINT T
AB(6);:IF TS=0 THEN LPRINT" No Position"
:GOTO 2096 ELSE LPRINT ABS(TS)"Shares "A
2096 GOSUB 500:CLOSE:GOTO 2000
3000 'open position
3010 GOSUB 200:GOSUB 300:GOSUB 400
3015 PRINT@203,"(Enter '*' for all stock
s on file)
3020 PRINT@130,"Enter Stock Symbol: ";:G
OSUB 6:PRINT@200,BL$;:IF IN$="" THEN 301
5 ELSE IF Y=32 THEN 100 ELSE IF IN$="*"
THEN 700 ELSE IF Y<65 OR Y>90 THEN 3015
3030 TS=0:PRINT@280,BL$;
3040 IF EOF(1) THEN 3090
3050 INPUT#1,DT$,BS$,ID$,SH,PR,CM
3060 IF ID$<>IN$ THEN 3040
3070 IF BS$="B" THEN TS=TS+SH ELSE TS=TS
-SH
3080 GOTO 3040
3090 PRINT@210,"Current Position: ";:IF T
S=0 THEN PRINT" None":GOTO 3096
3092 PRINT ABS(TS);:A="LONG":IF TS<0 THE
N A="SHORT"
3094 PRINT A
3096 GOSUB 500:CLOSE:GOTO 3000
4000 'end
4010 CLS:MENU

```

PCM

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# WEATHER: DOWNLOAD THE LOWDOWN

By Alexander Trevor

(Alexander Trevor is the executive vice president of computer resources at CompuServe. He also has a commercial pilot's license with instrument and glider ratings, and spends much of his spare time programming his Model 100, Color Computer and IBM/PC.)

Sometimes the applications for a new device are so obvious that you hardly have to point them out. For example, set a Model 100 in front of a pilot, and it won't take long for him (or her) to realize that this little portable powerhouse could be very handy for pre-flight and in-flight chores. Although there have been other machines that one could tote along in the cockpit, the 100 is the first one with a screen large enough to be useful in flight. Not only can the pilot retrieve flight plans and textual weather information obtained before takeoff from an information service (or entered manually), but the 100 is capable of pretty decent graphics—a capability that can be used to display weather radar maps.

Graphical weather maps are available from a number of sources, but one of the least expensive ways to obtain maps that are easily displayed on the Model 100 is to download the Vidtex® Radar

Maps from CompuServe. To do this, one must have a CompuServe Information Service account, and at least 16K of memory. The downloaded maps can consume up to 4K. The maps are transmitted in "run-length encoding," which reduces transmission time as well as minimizing the amount of RAM required to store them. However, without a program to decode the run-length encoding, the maps make about as much sense as the listing of a .CO file.

Two different graphic resolutions are used: "high resolution" which is 256 pixels wide by 192 high, and "medium resolution" (128 x 96). The accompanying listing is a program that will plot either high or medium resolution "run length encoded" graphics on the LCD screen. Since the Model 100 screen is only 240 x 64 pixels, High-Res maps are displayed in three sections, and medium-resolution maps in two.

Although anyone interested in weath-

er should find these maps useful, they are of particular interest to aircraft pilots, especially since maps can be displayed at any time (including in flight). They provide a useful reminder of general weather trends, although they are not practical for detailed storm avoidance like true airborne radar, since the data is at least a half-hour old, and the resolution is too coarse. Each pixel represents an area of 20 x 20 miles.

The run-length encoding spans all characters from 30 (decimal) through 511, so eight-bit reception must be enabled on your Model 100. This is done by setting the TELCOM status to M8N1E. However, CompuServe normally sends seven-bit data with even parity, so you will see some strange garbage as you log in with this setting. The solution is to log on with default status (M711E) and change your terminal parameters on CompuServe to set the parity bit to zero. This is easily accom-





(View or Change Current Terminal Parameters). Next, select "8" (Parity) and set it to zero. Finally, exit the DEFAULT program and request that changes be effective for future sessions. Before logging on the next time, change your terminal parameters to M8N1E in *TELCOM*. Now when you log on you will see a little bit of strange stuff until you get to the "Password:" prompt. This is because, until you identify yourself, the host computer does not know what terminal parameters you desire. So, the initial "User ID:" prompt is sent with even parity, and those characters with the parity bit set to one (s, l and space) will appear as graphics characters on the 100.

At this point everything should appear normal, and you can go to the Aviation Weather section, or directly to the weather maps (GO AWX4). The program will correctly inform you that *TELCOM* is not equipped to display graphics and that they may appear as meaningless characters, but you can ignore this. When you see "CompuServe Vidtex Radar Maps," choose "1"—Prepare a map for display. Next, select "2"—Prepare current U.S. radar reports. The system will list the three letter ID of each radar site, and the GMT time of the report being collected. After all reports are collected, on the next menu choose "2"—Display prepared map. You may select any of the maps, but before you press ENTER after your choice, you must first press F2 (Down) and specify the name you wish to use for the downloaded file (MAP1 or whatever). Then press ENTER, and you will be treated to several screenfuls of utter garbage, but don't panic! Just wait until you hear a BEEP, then press F2 (Down) to termi-

nate the download, and ENTER to tell the host computer to proceed. You can now log off or continue with your on-line session.

Once off-line, disconnect and go back to the menu. From here, you can run the GRAPH.RA program. Give it the file name you specified to *TELCOM*, and watch the current weather map appear! An outline of the state boundaries will be drawn with radar "echoes" superimposed on top. "Weak" and "moderate" echos will appear as horizontal shading, while stronger echoes appear solid black. When the screen is full, press any key to see the next section.

A design "feature" of the Model 100 will very occasionally cause a map to be partially trashed. For some reason, the Model 100 will not store a delete character (&H7F) in a RAM file without some sleight of hand, and one does not get an opportunity to do much magic in *TELCOM*. The problem can be avoided by writing a special purpose communications program which replaces the delete character with something else.

One final remark for those contemplating the use of this program in aircraft: Pilots need not be overly concerned about operating a Model 100 in flight. Although the Federal Aviation Regulations (FAR's) saddle the pilot in command with the responsibility of determining whether or not an electronic device (such as the Model 100) will cause harmful interference with navigation or communications radios, I have found nothing to suggest a problem. My Model 100 has many hours of instrument flight time in my Cherokee Challenger, and I have never noticed any ill effects. I hear the same thing from other pilots who regularly fly 172's, King Airs and such with their little white boxes.

lished by logging on, then typing "GO CIS-9" at the "!" prompt, or by running DEFAULT from the programmers' area. From the DEFAULT menu, select "5"

#### The listing:

```
10 'CompuServe Vidtex Graphics Plotter
11 'Use Telcom Stat M8N1E to down GRAFIX
12 'Set PARITY ZERO on CompuServe
14 'By A.B. Trevor, August 1983
15 DEFINT A-Z
20 INPUT "File to plot";FL$:OPEN FL$ FOR
INPUT AS 1
30 IF EOF(1) THEN PRINT FL$" not a graph
ics file":STOP
40 IF ASC(INPUT$(1,1))<>27 THEN30
60 CLS:T=0:MX=240:LM=0:A$=INPUT$(2,1):IF
A$="GH"THEN SF=256 ELSE IF A$="GM"THEN
SF=128:MX=SF:LM=56 ELSE 30
70 'Now decode the RLE
80 GOSUB 250:X1=X:Y1=Y:GOSUB250:IF B=0TH
EN80
```

```
90 IF B>64 THEN B=96:GOSUB 260
120 IF X1>=MXTHEN160
150 IF X<MX AND X>X1 THEN LINE(X1+LM,Y1)
-(X+LM,Y1) ELSE LINE(X1+LM,Y1)-(MX+LM-1,
Y1)
160 IF Y>Y1 THEN LINE(LM,Y)-(X+LM,Y)
200 GOTO80
250 B=ASC(INPUT$(1,1))-32:IF B=-2 THEN B
=96
260 X=X+B:IF X>=SF THEN X=X-SF:Y=Y+1:IF
Y=64THEN GOSUB300
270 IF EOF(1)THEN GOSUB300
280 RETURN
300 FORS=5000TO9999STEP-400:SOUNDS,1:NEXT
310 IF INKEY$="" THEN 310
315 T=T+128:IF T>SF THEN CLS:END
320 Y=0:CLS:RETURN
```

PCM



# The PoCo Calendar

By Ronald Paludan

*Here's a useful appointment calendar for LCD screen with options to tell you the time and date, set an alarm and print any month from 1582 A.D. into the future!*

The built in ADDRSS and SCHEDL programs of the Model 100 have replaced my traditional appointment book. There was however, one feature that the appointment book had that the Model 100 didn't—monthly calendars. Thus *PoCo Calendar* was born. At first, the program was merely a perpetual calendar, but a number of features have been added to increase its utility. The final version uses under 2900 bytes.

When the program is RUN, it will display the current month's calendar. The current day is highlighted by a cursor. To display the previous month, press the "-" key. For the next month, press the "+=" key. Any month of the Gregorian Calendar (1582 A.D. to present and future) can be displayed by pressing "1" (Note: use the keyboard 1, not the function key F1). The program will prompt you to enter MONTH/YEAR? Enter the first three letters of the desired month (use all capitals) followed by a comma and the year. Include all digits for the year (JUL,1984 not JUL,84). Pressing "2" will turn on or off a display of the current time and date. Key "3" will make a copy of the displayed calendar on a printer.

The fourth option allows you to use the PoCo as an alarm clock. After pressing "4," enter the alarm time using the same format that you used for setting TIMES\$ (hour:minute:second—see Page 18 of your user's manual). You may leave off the seconds and enter hour:minute. Remember that the Model 100 uses a 24 hour "military" clock. If you want the alarm to sound at 1:00 p.m., then set the alarm time for 13:00:00. After setting the alarm, the program will return to the calendar display and an asterisk (\*) appears next to option four. To cancel the alarm, press 4 again. When the alarm sounds, it will beep for 27 seconds or until any key is pressed.

By using the cursor control keys, the cursor can be moved from one date to another. Moving the cursor beyond the upper or lower boundaries of the calendar will change the display to the previous or next month respectively. If you press the 5 key, the program will search

your NOTE.DO file and display any messages for that day and month. In order for this option to work, your NOTE.DO messages must include the month followed by the day. For example: 09/01 for September first. If there are no messages for that date, the program will print "NOTHING SCHEDULED FOR (date)" and prompt you to press any key to return to the calendar display.

To exit *PoCo Calendar*, press key "6" and the program will return to the menu screen.

There are two techniques used in *PoCo Calendar* which other programmers may find useful. One is the use of inverse characters for the calendar header and the cursor. Printing CHR\$(27); "p" causes subsequent characters to be printed in inverse mode. Printing CHR\$(27); "q" restores printing to normal mode (see Lines 130 and 540). The other technique of interest is the clock interrupt used for the alarm. Line 420 instructs the computer to stop whatever it is doing and execute a subroutine starting at Line 650 when the computer's clock (TIMES\$) matches the alarm time (TS\$).

DECEMBER 1983						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



# The listing:

```

10 REM POCO CALENDER by Ron Paludan
20 DIMM$(12),D(12)
30 FORX=1TO12:READM$(X),D(X):NEXT
40 CLS:SCREEN 0,0
50 Y=1900+VAL(RIGHT$(DATE$,2)):M=VAL(LEFT$(DATE$,2)):CT=VAL(MID$(DATE$,4,2)):CD=CT:GOTO90
60 CLS:CD=1:CT=1:INPUT"MONTH,YEAR";M$,Y:FORM=1TO12
70 IFLEFT$(M$(M),3)=LEFT$(M$,3)THEN90
80 NEXTM:PRINT:PRINT"NO SUCH MONTH":PRINT:GOTO60
90 MN=M:YR=Y:MO=M:YE=Y:D=1:IFMN<3THENMN=MN+12:YR=YR-1
100 K=D+2*MN+INT(.6*(MN+1))+YR+INT(YR/4)-INT(YR/100)+INT(YR/400)+2
110 K=INT((K/7-INT(K/7))*7+.5):K=K-1:IFK<0THENK=6
120 CLS
130 PRINTTAB(7-LEN(M$(MO))/2);CHR$(27);"p ";M$(MO)" "YE;CHR$(27);"q"
140 PRINT" S M T W T F S"
150 T=K:DA=1:CP=81+K*3:CX=K*3:IFCT=1THEN180
160 FORX=1TOCT-1:CP=CP+3:CX=CX+3:IFCX>18THENCX=CP+19:CD=CT
170 NEXTX:CD=CT
180 IFT>6THENPRINT" ":T=0
190 PRINTTAB(T*3)STR$(DA);:DA=DA+1:T=T+1
200 DM=D(MO):IFM<>2THEN260
210 IFY/4<>INT(Y/4)THEN260
220 IFY/400=INT(Y/400)THEN250
230 IFY/100<>INT(Y/100)THEN250
240 GOTO260
250 DM=DM+1
260 IFDA<DM+1THEN180
270 PRINT" ";:PRINT@25," "
280 PRINT@23,"1. NEW MONTH":PRINT@63,"2. TIME/DATE":PRINT@103,"3. PRINT CALENDER":PRINT@143,"4. SET ALARM"
290 PRINT@183,"5. SCHEDULE":PRINT@223,"6. MENU"
300 IFAL=1THENPRINT@142,"*"
310 Q$=INKEY$:Q=VAL(Q$):IFQ$<>"+ANDQ$<>"=THEN330ELSEM=MO+1:IFM>12THENM=1:Y=Y+1
320 CT=1:CD=1:GOTO90
330 IFQ$<>"-THEN350ELSEM=MO-1:IFM<1THENM=12:Y=Y-1
340 CD=1:CT=1:GOTO90
350 IFQ=1THEN60
360 IFQ=2ANDFL=1THENPRINT@263,SPACE$(15):PRINT@303,SPACE$(15);:FL=0:GOTO390
370 IFQ=2ANDFL=0THENFL=1
380 IFFL=1THENPRINT@263,"TIME:"TIME$:PRINT@303,"DATE:"DATE$:
390 IFQ<>3THEN400ELSEFORW=23TO263STEP40:

```

```

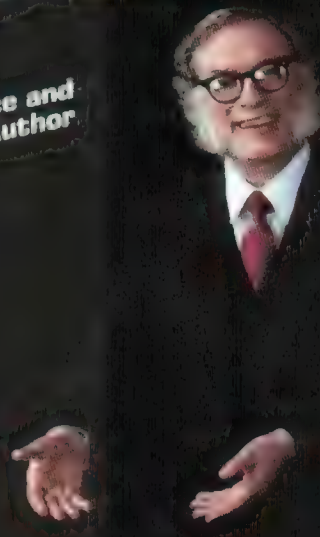
PRINT@W,SPACE$(17);:NEXT:LCOPY:GOTO280
400 IFQ=4ANDAL=1THENPRINT@142," ":AL=0:TIME$ OFF:GOTO430
410 IFQ<>4THEN430ELSECLS:LINE INPUT"SET ALARM TIME-";T$:IFLEN(T$)<6THENT$=T$+"":00"
420 ONTIME$=T$GOSUB650:TIME$ ON:AL=1:GOTO120
430 IFQ$=CHR$(31)ORQ$=CHR$(30)ORQ$=CHR$(29)ORQ$=CHR$(28)THENPRINT@CP-1,STR$(CD)" ";
440 IFQ$<>CHR$(28)THEN460ELSECP=CP+3:CX=CX+3:CD=CD+1:IFCD<=D(MO)THEN520ELSEM=MO+1:IFM>12THENM=1:Y=Y+1
450 CD=1:CT=1:GOTO90
460 IFQ$<>CHR$(29)THEN480ELSECP=CP-3:CX=CX-3:CD=CD-1:IFCD>0THEN520ELSEM=MO-1:IFM<1THENM=12:Y=Y-1
470 CD=D(M):CT=D(M):GOTO90
480 IFQ$<>CHR$(30)THEN500ELSECP=CP-40:CD=CD-7:IFCD>0THEN520ELSEM=MO-1:IFM<1THENM=12:Y=Y-1
490 CD=D(M):CT=D(M):GOTO90
500 IFQ$<>CHR$(31)THEN520ELSECP=CP+40:CD=CD+7:IFCD<D(MO)THEN520ELSEM=MO+1:IFM>12THENM=1:Y=Y+1
510 CD=1:CT=1:GOTO90
520 IFCX>18THENCX=CP+19:CX=0
530 IFCX<0THENCX=CP-19:CX=18
540 PRINT@CP-1,CHR$(27);"p";" "RIGHT$(STR$(CD),LEN(STR$(CD))-1)" ";CHR$(27);"q";
550 IFQ<>5THEN640ELSECLS:S$=RIGHT$(STR$(MO),LEN(STR$(MO))-1):IFLEN(S$)<2THENS$="0"+S$
560 D$=RIGHT$(STR$(CD),LEN(STR$(CD))-1):IFLEN(D$)<2THEND$="0"+D$
570 S$=S$+"/"+D$:OPEN"NOTE.DO"FORINPUTAS1:SF=0
580 LINE INPUT#1,A$:IFINSTR(A$,S$)<>0THENPRINTA$:SF=1
590 IFEOF(1)THEN610
600 GOTO580
610 IFSF=0THENPRINT:PRINT" NOTHING SCHEDULED FOR "S$
620 CLOSE:PRINT:PRINT" HIT ANY KEY TO RETURN TO CALENDER":CT=CD
630 IFINKEY$=""THEN630ELSEGOTO90
640 IFQ<>6THEN300ELSEMENU
650 PRINT@142," ":PRINT@0,INKEY$
660 FORX=1TO200:BEEP:IFINKEY$<>" "THENX=199
670 NEXTX:RETURN
680 DATAJANUARY,31,FEBRUARY,28,MARCH,31,APRIL,30,MAY,31,JUNE,30
690 DATAJULY,31,AUGUST,31,SEPTEMBER,30,CTOBER,31,NOVEMBER,30,DECEMBER,31

```



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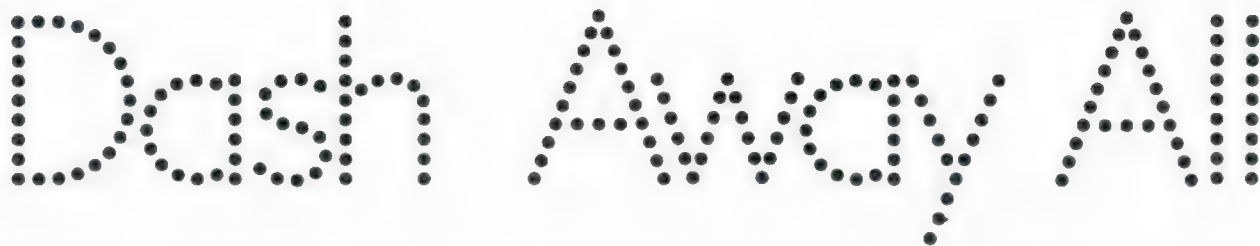
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ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE \_\_\_\_\_





By Robert Frowenfeld

Here's a little program that you should find both educational and fun to use. It's a program that uses the sound generator chip in your Model 100 to generate Morse code. As you can see by the accompanying table, each character in Morse code is made up of a series of dots (short sounds) and dashes (longer sounds). There are also a few, simple rules that govern the length of the sounds and pauses that make up each character. First of all, the length of time for a dot '.' is considered to be one unit. The length of time for the sound of a dash '-' is three times that for a dot, or three units. There is a one time unit pause between

each dot (or dash). Also, there is a pause of three time units between each character to be transmitted, and a pause of five time units between words. To 'see' how this works see the drawing where each of the letters in the word CAT are shown as they would be transmitted.

When you first run this program a display will appear illustrating the 40 Morse code characters that can be sent. This program also includes a special function that lets you test your Morse code receiving skills. There is a speed level which can be adjusted to any integer number between 1 and 10. To select a different speed simply press the

ENTER key when requested to input a message. Once you've decided on a message to transmit, enter it from the keyboard and press ENTER. As each letter is being 'beeped' out at you, it will be displayed on the Model 100's screen. If you want to see (and hear) all the available characters, just type in the word TEST for your message. Remember, you must always use upper case letters when typing in your message. To end the program just type the word MENU and you will be returned to your Model 100's Menu display. Well, give it a try and see if you can start to develop the proper sense of timing to receive Morse code; S.F.B.M. would be proud of you!

#### Morse Code Alphabet

A .-	I ..	Q ---	Y -.--	6 -....
B -...	J .---	R .-. .	Z --..	7 --...
C -.-. .	K -.- .	S ...	0 -----	8 ----.
D -.. .	L .-..	T -	1 .----	9 ----.
E .	M --	U ..-	2 ..----	. .-.-.-
F ..-. .	N -. .	V ...-	3 ....-	, --.-.-
G --. .	O ---	W .--	4 .....-	? .-.-.-
H ....	P -. .	X -.- .	5 .....-	/ -.-.-

#### The listing:

```
1 CLEAR 2000:DEFINT B-Z:DEFSTR A
10 CLS
20 SOUND ON
30 DIM A(40)
40 SP=5
50 DATA A.-,B-...,C-.-.,D-..,E.,F.-.,G-
-,H....,I..,J.---,K-.-,L.-..,M--
55 DATA N-. ,O---,P.-.,Q-.-.,R.-.,S... ,T-
,U.-.,V...-,W.--,X-.-.,Y-.-.,Z-..
60 DATA 0-----,1.----,2.----,3....-,4...
.-,5.....,6-....,7-....,8-----,9----.
65 DATA .-.-.-.-,,"-.-.-.-",?..-.-.-,/-.-.-.
70 FOR I=1 TO 40:READ A$(I):NEXT I
75 DATA "ABCDEFGH IJKLMN O PQRSTU VWXYZ01234
56789.,?":READ AA
80 FOR J=1 TO 8:FOR K=1 TO 5:I=J+(K-1)*8
:IF K=5 AND J=8 THEN PRINT LEFT$(A(I),1)
```

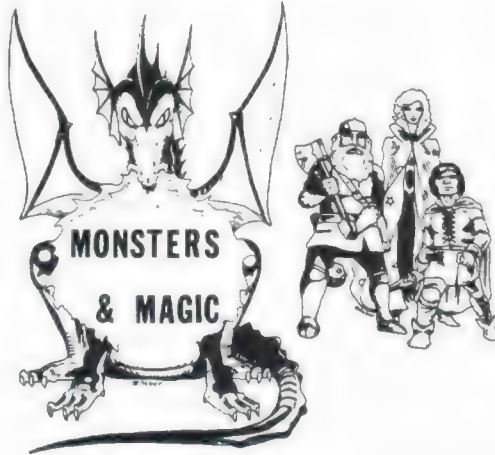
```
" ";MID$(A(I),2); ELSE PRINT LEFT$(A(I),
1)" ";USING"(4SP)";MID$(A(I),2)+ " "1
81 NEXT K:NEXT J
90 FOR I=1 TO 5000:NEXT I
100 'input message
105 CLS:PRINT@40,"Speed:"SP:PRINT:PRINT"
Input Message: ";:LINEINPUT A$:IF A$="ME
NU" THEN MENU ELSE IF A$="TEST" THEN A$=
AA$:GOTO 110
107 IF A$="" THEN GOSUB 200:GOTO 100
110 PRINT@215,"";:FOR I=1 TO LEN(A)
115 A1=MID$(A,I,1):PRINT A1$;:IF A1=" "T
HEN GOSUB 180:GOTO 150
120 J=INSTR(AA,A1):IF J=0 THEN 150
125 A2=MID$(A(J),2):K=LEN(A2)
130 FOR J=1 TO K:A3=MID$(A2$,J,1):IF A3=
"." THEN LN=SP ELSE LN=SP*3
135 SOUND 3000,LN
140 IF J<>K THEN SOUND 1,SP
145 NEXT J
148 SOUND 1,SP*3
150 NEXT I
155 GOTO 100
180 SOUND 1,SP*5
190 RETURN
200 'change speeds
210 CLS:PRINT@128,"Enter Speed (1-10): "
;:LINEINPUT A$:SP=VAL(A$):IF SP<1 OR SP>
10 THEN 210 ELSE RETURN
```





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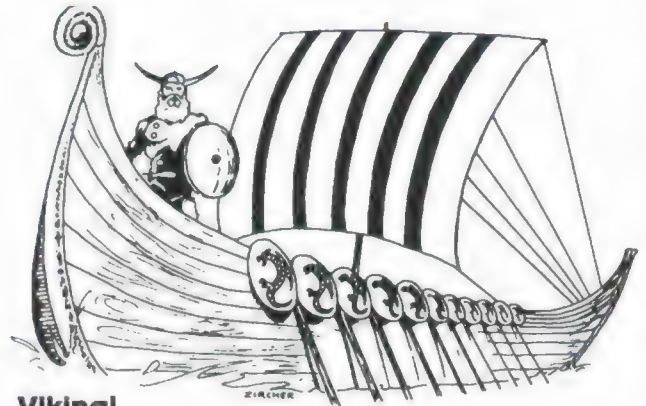


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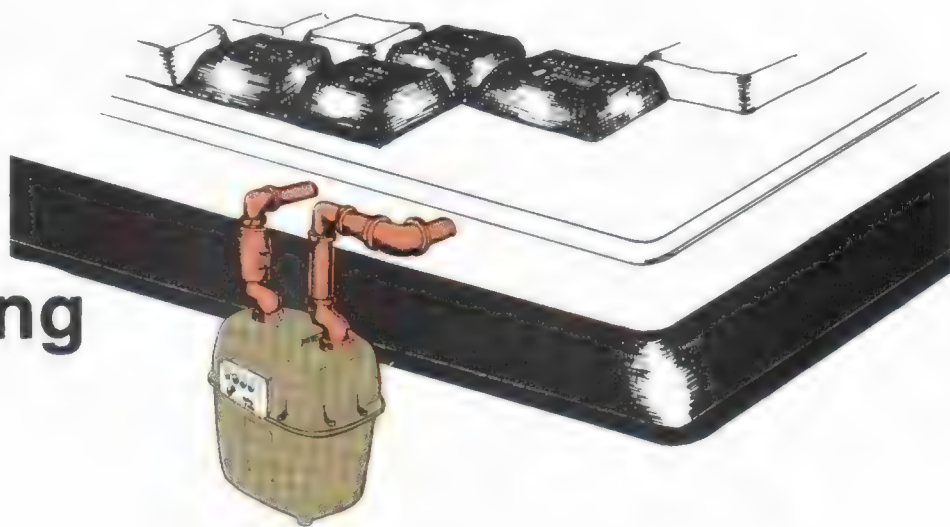




*Want to forecast your heating bill for the coming winter? Pondering a switch to natural gas? Or perhaps to a woodstove? Here's a program that will help answer such burning questions.*

# Keeping an Eye on Home Heating Cost

By Joseph Donohue



If you saved last year's bills, you already know the approximate number of gallons (oil), kilowatt-hours (electricity), cords (wood), or therms (natural gas) your house consumes each winter.

If you're totally new at the energy game, don't fret. This program enables you to make a "ballpark" estimate of fuel use by relying on a standard heating industry formula.

Once it determines how much fuel you use, the computer will tally the cost using current prices. Then it lets you see how much you're saving — or spending — compared to other fuels.

Before running the program, keep these points in mind.

First, the program works best if you're comparing heating systems designed to warm an entire house.

Use of kerosene heaters, solar collectors, electric heaters, and other supplemental heating sources obviously can alter your bill.

The basic measure of heat content is the British Thermal Unit (BTU). A BTU represents the amount of energy needed to raise the temperature of one pound of water one degree Fahrenheit.

Various fuels contain the following BTUs (on average):

Heating Oil, gallon:	139,400
Natural gas, therm:	100,000
Electricity, kilowatt-hour:	3,413
Wood, cord (dry):	20,000,000

In southern New Jersey, a standardized (1,560-square-foot) house that's fairly well insulated devours about 78 million BTUs each heating season.

Except for electric heat, which is delivered at 100 percent efficiency once it reaches the house, other heaters perform less well.

A U.S. Department of Energy study places average seasonal efficiency for a conventional oil heater at 76 percent. A gas heater is 65 percent. A woodstove is about 55 percent.

Using these guidelines, the house mentioned above requires 675 gallons of heating oil, 1,053 therms of gas, 4.9 cords of wood, and 22,854 kilowatt-hours of electricity.

When using the program, you simply enter the number of BTUs in the fuel you use, and the efficiency (.76 for oil, .55 for wood, .65 for gas, or 1.0 for electricity).

If you kept last year's bills and already know the total fuel you used, enter that number.

If you have no idea how much fuel your house gobbles up, try the Heat Loss Method.

The computer first asks how many BTUs per hour your house gobbles. If it's fairly well-insulated, the figure will be about 37,000. If it's medium, 50,000. If it's really drafty, use 75,000.

The computer next asks the average number of heating degree days in your area.

You can find this by calling the local

weather service or your local utility. You also can write to the National Climatic Center, Federal Building, Asheville, North Carolina 28011.

A heating degree day is figured by subtracting the average outside temperature for a given day from 65 degrees. For instance, if the temperature is 35, then the heating degree day is  $65 - 35 = 30$ . It provides a reliable measure of each winter's coldness.

In the continental United States, the total annual heating degree days range from a high of 10,000 in North Dakota to a low of 500 in Florida.

Next, you enter the design temperature. This is the coldest temperature at which your heating system will keep your house at 68 degrees. If it gets colder outside, your house will get chilly.

As with heating degree days, design temperature varies with latitude from -25 in Bismarck, North Dakota to +36 degrees in Tampa, Florida (see accompanying table).

Finally, the computer requests the efficiency and BTU content of the fuel.

It then uses the modified American Society of Heating, Refrigerating, and Air-Conditioning Engineers degree-day formula to estimate fuel use.

Now that the computer knows how much fuel you'll need, it will hand you the tab.

The screen will read, "Want Gas (G), Oil (O), Electricity (E), or Wood (W)?"

It's fairly easy to find out the price of wood or oil. Check the phone book and



**Table 1**  
**Design Temperatures**

State	City	(°F)	State	City	(°F)
Alabama	Birmingham	19	Nevada	Reno	2
Alaska	Anchorage	-25	New Hampshire	Concord	-11
Arizona	Phoenix	31	New Mexico	Albuquerque	14
Arkansas	Little Rock	19	New York	Buffalo	3
California	Los Angeles	41	New York	New York	12
California	San Francisco	35	North Carolina	Raleigh	16
Colorado	Denver	-2	North Dakota	Bismarck	-24
Connecticut	Hartford	1	Ohio	Columbus	2
Florida	Tampa	36	Oklahoma	Tulsa	12
Georgia	Atlanta	18	Oregon	Portland	21
Idaho	Boise	4	Pennsylvania	Philadelphia	11
Illinois	Chicago	-3	Pennsylvania	Pittsburgh	5
Indiana	Indianapolis	0	Rhode Island	Providence	6
Iowa	Des Moines	-7	South Carolina	Charleston	23
Kansas	Wichita	5	South Dakota	Sioux Falls	-14
Kentucky	Louisville	8	Tennessee	Chattanooga	15
Louisiana	New Orleans	32	Texas	Dallas	19
Maryland	Baltimore	12	Texas	San Antonio	25
Massachusetts	Boston	6	Utah	Salt Lake City	5
Michigan	Detroit	4	Vermont	Burlington	-12
Minnesota	Minneapolis	-14	Virginia	Richmond	14
Mississippi	Jackson	21	Washington	Seattle	28
Missouri	St. Louis	4	West Virginia	Charleston	9
Montana	Helena	-17	Wisconsin	Madison	-9
Nebraska	Lincoln	-4	Wyoming	Cheyenne	-6

call a local fuel merchant or wood distributor. In southern New Jersey, oil currently sells for about \$1.10 per gallon, wood sells for about \$100 per cord.

To calculate the price of gas or electricity, you'll need to call your local utility. Ask them to read you their schedule of residential rates.

Rates usually consist of a fixed service charge, varying charges per therm or kilowatt-hour depending on the level of consumption, and a fuel surcharge.

You enter this data at Line 230 (for gas) and Line 410 (for electricity).

For natural gas, the cost in southern New Jersey for the first 33 therms is \$26.30. This is entered as S.

Above 33 therms, the charge is 60.5 cents apiece. This amount is entered as Q.

Currently, there is no fuel surcharge. So zero was entered as R.

For electricity, the service charge (S) is \$3.98, the first 500 kilowatt-hours cost 8.856 cents apiece (R), all others cost 6.499 cents apiece (Q), and there is a fuel surcharge of -.329 cents per kilowatt-hour (P).

The surcharge in this example is a negative number because electric customers in southern New Jersey cur-

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rently are earning a credit due to an overcharge last year. Normally, it would be a positive number.

If your rates seem lower, remember that New Jersey has among the highest electric and natural gas rates in the nation.

Between Lines 240 and 270, and Lines 415 and 445, gas and electricity consumption is distributed proportionately for each of the six heating months.

The symbols represent the months as follows:

Z = October:	9 percent
Y = November:	11 percent
X = December:	18 percent
W = January:	20 percent
V = February:	18 percent
U = March:	14 percent
T = April:	10 percent

You may have to tinker with this part of the program. The pattern of energy use may be different in your locale.

In Florida, for instance, there may be no need to heat in October, March, and April.

Now, let's run through an example. First, we'll assume you know last year's fuel consumption. Let's say you used 1,000 gallons of oil.

RUN	
FUEL COST ESTIMATOR	
TOTAL FUEL:	1,000
WANT G, O, E, OR W	O
\$ PER GALLON?	\$1.10
ANN COST (O):	\$1,100.

Now, you want to find out how much heating your house would cost with natural gas. The screen asks whether you want to compare other fuel. You enter "Y" for yes.

It then asks for the BTU content of your existing fuel, in this case, 139,400. Then, the efficiency (.76).

Next, the computer asks for the BTU content of the alternative fuel, in this case 100,000. Then, the efficiency of fuel two (.65).

COMP OTHER FUEL (Y/N)	Y
BTU CONT (F1):	139,400
EFF (F1):	.76
BTU CONT (F2):	100,000
EFF (F2):	.65
ALT FUEL:	1517.66
WANT G, O, E, OR W?:	G
ANN COST (G):	\$962.55

You can also compare wood or base-board electric heater.

When you do, the totals are:

ALT FUEL:	8.50
ANN COST (W):	\$815.04
ALT FUEL:	32,938.57
ANN COST (E):	\$2,142.66

So we find that wood is the cheapest source of heat, followed in order by natural gas, oil, and electricity.

If you don't know last year's fuel bill, use the heat loss method.

KNOW TOTAL FUEL?	N
HEAT LOSS METHOD	
BTUS PER HOUR?	50,000

DEGREE DAYS?	4,600
DESIGN TEMP?	7
EFFICIENCY?	.76
BTU CONT.?	139,400
TOTAL FUEL =	854.14
WANT G, O, E, OR W?	O
ANN. COST (O) =	\$1,024.97
COMP OTHER FUEL? (Y/N)	N

If you want to compare other fuels using the heat loss method, you have to go back and use the formula with each alternate fuel because of the mathematics.

Try natural gas this time. The data is the same except for the efficiency and the BTU content.

HEAT LOSS METHOD	
BTUS PER HOUR:	50,000
DEGREE DAYS:	4,600
DESIGN TEMP:	7
EFFICIENCY:	.65
BTU CONTENT:	100,000
TOTAL FUEL:	1392
WANT G, O, E, OR W?	G
ANN COST (G):	\$886.64

For wood and electricity, you get the following results:

TOTAL FUEL:	8.22
ANN COST (W):	\$822.65
TOTAL FUEL:	26,513.85
ANN COST (E):	\$1746.26

Once again, wood emerges as the favorite, electricity as the laggard, with gas and oil in between.

```

10 CLS
15 DEFINT L,O,M
16 DEFSNG F
20 PRINT @50,"FUEL BILL ESTIMATOR"
40 PRINT@123,"Total Fuel=A      Heat Loss
Method=B"
45 PRINT@210,"(Enter A or B)":INPUTA$
50 IF A$="A"GOTO 80
51 IF A$="a" OR A$="b" THEN GOSUB 70
53 CLS:GOSUB 800:PRINT@280,"Btus per ho
ur":INPUT H
54 CLS:PRINT@280,"Degree Days":INPUTD
55 CLS:PRINT@280,"Design Temp":INPUTT
56 CLS:GOSUB700:PRINT@280,"Efficiency:"
:INPUTE
57 CLS:GOSUB700:PRINT@280,"BTU Content
of Fuel":INPUTC
60 F=H*D*24/((68-T)*E*C):BEEP:CLS:PRINT@
120,"TOTAL FUEL (HEAT LOSS METHOD)":;F:G
OTO200
70 CLS:PRINT@160,"PLEASE USE CAPITAL LET
TERS":FOR X=1 TO 1000:NEXT X:GOTO10

```

```

80 CLS:PRINT @120,"Total Fuel:":INPUT F
85 GOTO 200
90 F=DD:BEEP:CLS:PRINT@160,"Alternate Fu
el:":F
200 PRINT@280,"Want Gas (G), Oil (O), E
lectricity (E), or Wood (W)":INPUTA$
202 A=.09*F:B=.11*F:C=.18*F:D=.20*F:E=.1
8*F:G=.14*F:H=.10*F
205 IF A$="O" THEN 300
207 IF A$="E" THEN 410
208 IF A$="W" THEN 500
230 S=29.22:QQ=.6360:R=0
235 REM"RATES AS OF 5/83:SERVICE CHARGE
INCLUDES FIRST 33 THERMS"
240 Z=S+((A-33)*QQ)+(A*R)
245 Y=S+((B-33)*QQ)+(B*R)
250 X=S+((C-33)*QQ)+(C*R)
255 W=S+((D-33)*QQ)+(D*R)
260 V=S+((E-33)*QQ)+(E*R)
265 U=S+((G-33)*QQ)+(G*R)
270 T=S+((H-33)*QQ)+(H*R)
275 M=T+U+V+W+X+Y+Z
280 CLS:BEEP:PRINT@ 160,"Annual Bill (G

```



```

as)=$";M
285 GOTO 520
300 PRINT @280, "Dollars per gallon:";IN
PUT J:0=F*J
310 BEEP:CLS:PRINT @160,"Annual Bill (O
il)=$";0
320 GOTO520
410 S=3.98:R=.112536:Q=.078391:P=-.01591
9
412 REM"RATES AS OF 10/83"
415 Z=S+(500*R)+(A-500)*Q)+(A*P)
420 Y=S+(500*R)+(B-500)*Q)+(B*P)
425 X=S+(500*R)+(C-500)*Q)+(C*P)
430 W=S+(500*R)+(D-500)*Q)+(D*P)
435 V=S+(500*R)+(E-500)*Q)+(E*P)
440 U=S+(500*R)+(G-500)*Q)+(G*P)
445 T=S+(500*R)+(H-500)*Q)+(H*P)
450 M=Z+Y+X+W+V+U+T
455 CLS:BEEP:PRINT@160,"Annual Bill (Ele
ctricity)=$";M
460 GOTO 520
500 CLS:PRINT @160,"Dollars per cord":IN
PUT K:L=F*K
510 BEEP:CLS:PRINT @160,"Annual Bill (Wo
od)=$";L
520 PRINT:INPUT "Compare other fuel? (Re
member NOT to use with heat loss method)
(Y/N)";A$
530 IF A$="N"GOTO 10
535 GOSUB700
540 PRINT@280,"BTU CONTENT FUEL 1:";INPU
TI
560 CLS:GOSUB700:PRINT@280,"EFFICIENCY F
UEL 1:";INPUT E
570 D=I*E:DD=F*D
580 CLS:GOSUB700:PRINT@280,"BTU CONTENT
FUEL 2:";INPUT I
590 CLS:GOSUB700:PRINT@280,"EFFICIENCY F
UEL 2:";INPUT E
595 D=I*E
600 DD=DD/D
610 GOTO 90
700 CLS:PRINT@50,"BTUS      EFFICIENCY"
710 PRINT@80,"GAS      100000      .6
5 "
720 PRINT@120,"ELEC.      3413      1.
00 "
730 PRINT@160,"OIL      139400      .
76 "
740 PRINT@200,"WOOD  20000000      .
55 "
750 RETURN
800 PRINT@40,"INSULATION LEVEL      BTUS"
810 PRINT@80,"HIGH      37000
"
820 PRINT@120,"MEDIUM      50000
"
830 PRINT@160,"LOW      75000
"
840 RETURN

```

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**H**ave you been wondering what good you'll get from that socket on the Model 100 protected by a black plastic cover labeled BCR (for bar code reader)? Well, wonder no more.

Another reason your 100 was such a great buy is that there are *two* bar code readers now available for the PoCo that not only promise to open up the technology to smaller businesses, but to individuals as well. Besides the usual applications like sales and inventory, what that means (in the very near future) is no more keyboard entry for program listings! Magazine program listings will soon carry extra bar code pages to allow you to "wand-in" the program. It also means you can create your own bar codes on a good quality dot-matrix printer . . . opening up all kinds of possibilities. *PCM* is out in the forefront with a review of the first bar code reader to hit the market for the Model 100 (from B-T Enterprises . . . more on the that in the Product Review section).

#### **First, some bar code basics**

Bar codes have been around since the late '60s. Today, 144 companies now list themselves in the bar code manufacturer's guide, and there's a bimonthly for the industry called *Bar Code News*. But its very popularity has created dozens of different "languages"—the white and black lines that end up representing numbers and letters, or even entire BASIC statements. UPC, or Universal Product Code, has become the retail standard. Supermarket scanners are now routine, but it was only the summer of 1974 that the first UPC scanners were commercially installed. Bar codes are now used by many other industries—going by names like 3 of 9, 2 of 5, 2 of 7, NATI, EADN, JAN, LOGMARS, Codabar, and Plessey. Although fulfilling different functions, each bar code symbology operates on the same principal: pass a light source and a light detector close enough to the alternating white and black areas to be read, literally, as a code (sort of like the old Morse telegraph code of dots and dashes). In this case, it's a computer "telegraph operator" that then matches up the proper numbers and words to tell us humans what that code means.

But telegraph codes are to bar codes as a biplane is to a 747. For example, the bar code pattern dubbed "3 of 9" (in which there are nine vertical bars in each code and three of them are wide) has the possibility of 512 combinations or characters (twice as many as the entire ASCII set of 256). Mainly because

# A 'Magic Wand' Your Model 100

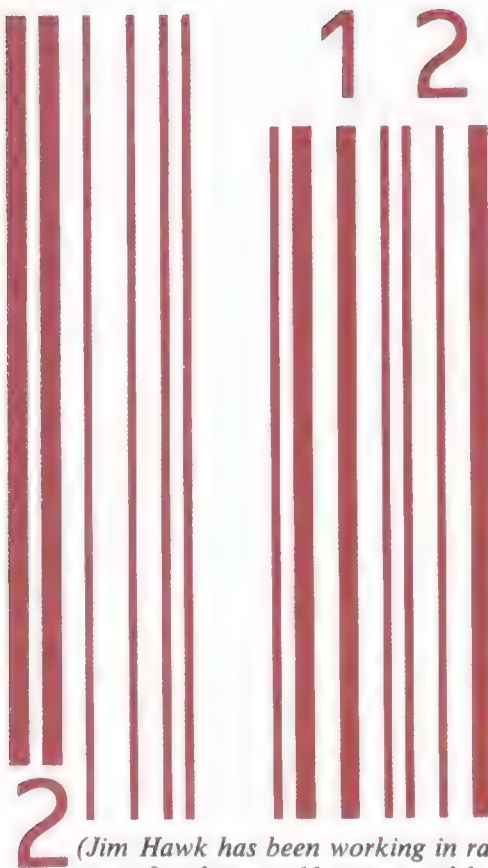
By Jim Hawk

*Soon, the new bar code technology will eliminate much of the laborious process of keying in program listings and provide for easy transfer of other important data.*





# For Model 100



(Jim Hawk has been working in radio news for the past 12 years, and has a science and electronics background. He also does freelance writing in Washington, D.C.)

the bar codes would be impractically long, only 43 alphanumeric characters are presently used.

## What's it for?

The main intent is for applications like billing, inventory, retailing and manufacturing. But most exciting to the non-business BCR user is the promise of cheaply reproduced software. Word is out that direct programming of the 100 via the bar code reader is just around the New Year's corner. With a few zips of your BCR "wand," you'll soon be able to directly enter program listings without all the manual entry and near-inevitable human error, wear and tear to man and machine, and general frustration from a program that won't run because a colon was typed in as a semicolon. (Bar codes have a built-in "check-digit," theoretically meaning the reader will get the information exact, or beep at you to try it again.) Gutenberg would be proud—his printed page (in this case, bar-coded page) offers to revolutionize software publishing, which up to now has mainly been confined to magnetic form. Whereas hundreds of cassettes of a piece of software might be turned out in a day, millions of pages of bar code could be printed in the same time.

This is new to just about everyone, so don't be embarrassed if you've never heard the term "wand" before. I discovered there's a whole new technological lingo.

## A few definitions

The wand is industry jargon for the hand-held unit that actually "reads" the bar codes. The wand, or scanner, connects to a decoder that times the binary 1's and 0's. It's connected via a 9-pin "data communication interface" (plug) and those signals enable the 100's BASIC to make the final interpretation. The combination of scanner, decoder and interface make up the device accurately termed a "reader." Trouble comes when you start having poor "resolution"—in this context, the minimum width that can be accurately scanned. Even high resolution scanners can be derailed by "voids," or light areas in the bar, often caused by printing errors. "First Read Rate" is defined as the percentage of correct readings that will be obtained in one pass of the scanner over the symbol. (Once you master the steady, sweeping motion needed to get an acceptable pass, that rate should be around 80 percent.) Another measure of BCR performance is "substitution error rate"—the ratio of the number of incorrect



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entries. The widely tested 3 of 9 code (called Code 39) is said to offer one substitution error out of 3 million characters read. That compares to human/keyboard "first read" error rate estimated around 1 to 250.

### Invasion of the Bar Codes

Once you start looking for bar codes, they're everywhere . . . like the one on the front of this very magazine—and, in fact, on virtually everything you might buy in the grocery store. Most of us use bar code technology so casually, we're hardly aware of it—like supermarket checkout systems using laser bar code readers that tell what the item is and its price. (Instead of wands, they use a super-sophisticated moving laser beam to read the code.)

Libraries, hospitals, auto manufacturing, film developing, package delivery—the list of bar code applications in business is astounding. But all that seems too high-tech and/or high priced. That supermarket BCR cost thousands. Now, the stunning news from Tandy is that Radio Shack will sell a bar code reader (as of Nov. 30, 1983), about the size and shape of a small carrot, for \$99.95 including the necessary software. Meantime, also hitting the market is B-T Enterprises' version of a bar code reader, selling for the subject-to-change price of \$279.

Both firms are taking advantage of solid-state LEDs (or Light Emitting Diodes) that allow small size and low power consumption (as well as low



**New Tech** Radio Shack's BCR, just out, includes operational software and carries a price tag of under \$100.

price). Both products are to decode UPC and 3 of 9, meaning small businesses can finally get in on a technology formerly for the Big Guys only.

A bar code device can be important in dealing with the biggest buyer of all: Uncle Sam. The Pentagon now requires bar coding on many contractor-supplied parts and documents. It wouldn't be Department of Defense without an abbreviation: DOD's standard is called LOGMARS, which stands for Logistics

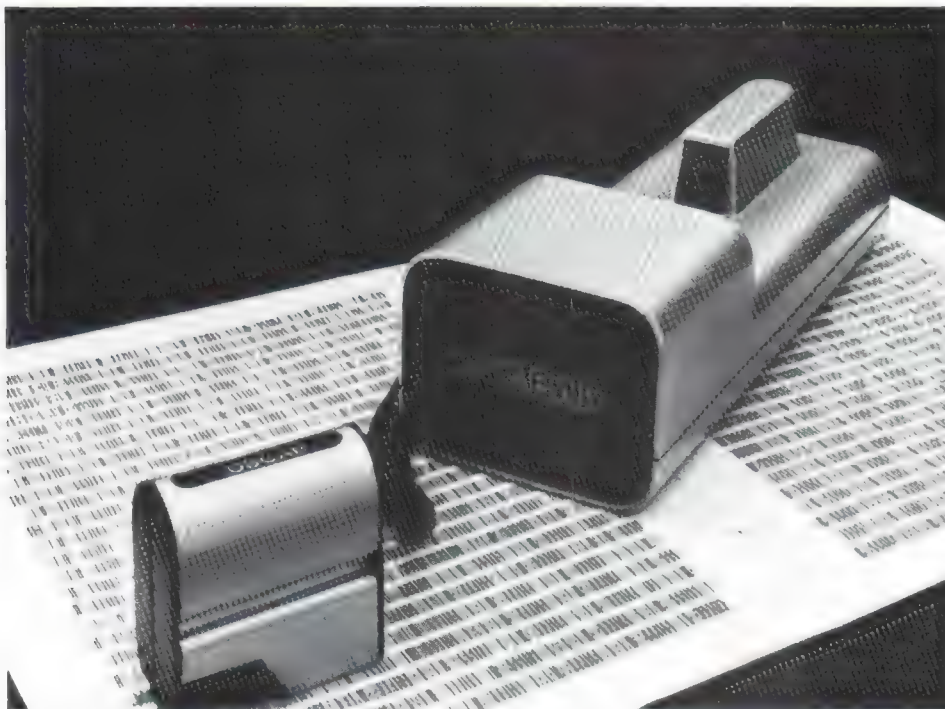
Applications of Automated Marking and Reading Symbols. And you won't just have to depend on other people's bar codes—a dot matrix printer with graphics capability can let you make your own. (Maybe I'll finally untangle my videocassettes!)

Once the software becomes available, Radio Shack says any DMP-120 or up can do the job of printing bar codes, which are really just fancy graphics. As for program entry, it's a matter of getting a standardized bar code system compatible with Microsoft BASIC . . . and therein lies a story.

### The Chicken or the Egg Syndrome

This idea of bypassing keyboard entry in favor of bar coding has been around a long time. But the advent of actually programming personal computers by bar code is relatively new, and there have been some false starts.

Carl Helmers, cofounder of *Byte Magazine*, made the first effort back in the fall of 1976 when he got the idea to put out a magazine of bar-coded programs called *Paper Bytes*. It never caught on because home computers were more bulky as well as expensive. "It's a chicken and egg thing," says Helmers. But while *Paper Bytes* bit the dust, Helmers went on to form North American Technology Institute and the NATI bar code. Helmers is responsible for a PASCAL program/report that I'm told went into Radio Shack's engineering development of the M100. NATI bar codes appeared to be the best way of squeezing the most



Databar's OSCAR is due in early '84.



programming in the least space, but it wasn't quite right for Tandy's applications. That may explain why Radio Shack decided to adopt its own Tandy Code Standard. It is primarily the same as Helmers' NATI, but has an extra "bit" to indicate whether it's a machine code or a BASIC code. Obviously, Tandy has high hopes for its bar code reader.

One good sign for the new generation of BCRs comes from Tandy's Texas neighbor: Hewlett Packard. HP is the primary supplier of "wand" technology, and currently offers a super-sophisticated calculator/computer (HP-41) that can be programmed via an optional wand. The limitation is that it reads HP-41 bar code only, and the programs are mostly engineering-oriented.

Another factor pushing BCR progress is the home computer competition: a firm called Databar out of Minneapolis intends to market its own Optical Scanning Reader (dubbed OSCAR) alleged to be compatible with Atari, Commodore, the no-longer-manufactured Texas Instruments 99/4A, and possibly Radio Shack's own Color Computer.

The company also has announced it will publish a \$120-a-year bar code magazine, containing programs that OSCAR will theoretically transfer to compatible computers via the cassette port. Release date is early 1984, although no actual hardware has yet been demonstrated.

Bar codes have even become "child's play." The Texas Instruments product called "Speak and Read" is still being sold (slowly), touting storybooks with bar codes on the bottom of each page. The child is supposed to rub the toy's wand over the bar code, and a voice-synthesis speaks the words to children. It seems like a good idea, but wand readers are fussy about the speed they're passed over bar codes, and kids get fussy when their toys act up; my own spot-check found only a few in stores this season.

Leave it to Tandy to come up with a true price vs. performance breakthrough. Although the 1984 computer catalog says the new bar code reader will decode NATI (as well as UPC and 3 of 9), Tandy decided enough modifications were needed to justify a new code.

Roy Irvine is Tandy's bar code buyer, and says the so-called "Tandy code" will be broad-based: allowing either direct entry of machine code, ASCII text, or "tokenized" BASIC. Tokenizing is a way of cutting down on the number of bar codes needed for a given size program: instead of using at least five characters for "GOSUB," you turn it into a one or two character bar code. On a 4K program this adds up quickly.

Experiments have already been done on the 3 of 9 code, allowing a person to

**"Once the software becomes available, Radio Shack says any DMP-120 or up can do the job of printing bar codes . . ."**

wand-in a program listing. But it's a very inefficient code for that kind of application. Tandy's plan is to market its own bar-code system, with software that can properly tokenize the various forms of BASIC used in the TRS-80 computer line. In other words, with the eventual listing of programs in Tandy bar code, a guy with a Model 100 and a Model II could "wand it in" on his PoCo, and then transfer it to his mini-mainframe. It means bar coding would be opened up to a much wider market than just the 100. It also likely will mean further price cuts for BCRs. Irvine sums it up: "We're trying to get the cost down

so everybody can buy one."

What can this new PoCo peripheral do or not do? It can decode several of the most popular industrial bar codes. It will soon be able to enter BASIC programs into the M100. It won't replace the cassette machine, or disk storage; it's still a manual system, and one estimate says it will take two to four minutes to enter a 4K program. No, the bar code reader will just be an excellent addition to an already excellent computer. And, there's no law against saving the program to cassette after you've entered it once by BCR. Soon, you won't have to decide that you *really* want a particular program listing before laboriously typing it in—just wave your "magic" wand.

#### Future Tech

Market Street Systems out of Portsmouth, N.H., is already selling a dedicated Model 100 and industrial-grade bar code printer that generates every major bar code, but the price is industrial-grade, too: \$6,800.

A glimpse of what the future holds comes from Spectra-Physics' industrial hand-held laser scanner. It looks exactly like something from the set of Star Trek, resembling the fictional "Phaser." And the advantages over a wand are numerous: it can be held up to 38 inches away and still read bar codes; it's faster, and can read through plastic wrapping and smudged codes that a wand would never be able to. This particular unit is for industrial applications, and costs more than the Model 100. But with advances in solid-state lasers (the one now marketed uses a miniature helium-neon gas laser) both the size and price will likely come down.

At the very least, future-tech products like this point to ever-expanding use of bar codes by all kinds of retailers. And when the *price* is right, can the hand-held laser scanner then be far off?

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# A Renumbering Routine for PoCo

By Larry Randall

**T**his short routine will renumber the lines of your BASIC programs. First store the program you wish to renumber in text as a .DO file. You will need enough space for another file of the same size. *Renum* generates the new file, named "NEW," and the old file is unchanged.

Next, execute *Renum* and answer the first question with the name of the file you wish renumbered. Give the name only—not the file extension.

The next two questions asked are for first line number you wish and the increment. After that just sit back and wait. Each time "WORKING . . ." flashes on the display, a new line is being scanned.

This routine checks for spaces between target numbers and commas, as in ON GOTO statements. This space checking takes time, so if you are sure there are no spaces to worry about then remove lines 190 and 250. My time test

took 2 minutes 23 seconds to renumber 5.5K of BASIC in text form with space checking. Another way to save time is to remove the "RESTORE AND RESUME" from the data statement in line 20. Be sure to adjust the "FOR S=6" to "FOR S=4" in line 120.

If there is an undefined line in your program, *Renum* will stop and point it out to you. You will then have to start over. When the run is completed, *Renum* will beep at you and display "COMPLETED."

## The listing:

```
0 BASIC LINE RENUMBER ROUTINE
  by:      l. randall
          12306 teri. dr.
          poway, ca. 92064
10 CLEAR1000:MAXFILES=2:DEFINT A-Z
20 CLS:FOR I=1 TO 6:READ A$(I):NEXT I:DATA GOT
0,GOSUB,RESTORE,THEN,ELSE,RESUME
30 INPUT "FILE NAME TO BE RENUMBERED: ";F
N$
40 FN$="RAM: "+FN$:OPEN FN$ FOR INPUT AS1:D=1
50 IF EOF(1) THEN CLOSE:GOTO 60 ELSE LINE INPUT
#1,A$:D=D+1:GOTO 50
60 D=D-2:DIMA(D,1):OPEN FN$ FOR INPUT AS1:PR
INT
70 INPUT "FIRST LINE NUMBER DESIRED: ";N
80 PRINT:INPUT "LINE INCREMENT DESIRED: "
;I:N=N-I:FOR K=0 TO D:LINE INPUT #1,A$:N=N+I
90 A$(K,0)=VAL(LEFT$(A$,5)):A$(K,1)=N:NEXT
100 CLOSE:OPEN FN$ FOR INPUT AS1:OPEN "RAM:NE
W.DO" FOR OUTPUT AS2:FOR K=0 TO D:CLS
110 PRINT@50,"WORKING.....":LINE INPUT #1,
A$:L2=LEN(STR$(VAL(LEFT$(A$,5)))):A$=STR
$(A$(K,1))+MID$(A$,L2):L=LEN(A$)
```

```
120 FOR S=1 TO 6:X=1
130 X=INSTR(X,A$,A$(S)):IF X=0 THEN 180
140 X=X+LEN(A$(S))
150 IF MID$(A$,X,1)=" " THEN X=X+1:GOTO 150
160 IF MID$(A$,X,1)>"0" AND MID$(A$,X,1)<=
"9" THEN GOSUB 190 ELSE 130
170 IF X<L THEN 130
180 NEXT:PRINT#2,A$:NEXT:BEEP:CLS:BEEP:P
RINT:PRINT:PRINT"          COMPLETE
D":END
190 IF MID$(A$,X,1)=" " THEN X=X+1:GOTO 190
200 L=LEN(A$):A2=VAL(MID$(A$,X,5)):A2$=S
TR$(A2):A2$=MID$(A2$,2):L2=LEN(A2$):C=-1
210 C=C+1:IF C>D THEN SOUND 8000,80:PRINT A$:
PRINT TAB(X-2);"^":PRINT"      ***** UNDEFIN
ED LINE NUMBER *****":END
220 IF A2=A(C,0) THEN A3$=STR$(A(C,1)) ELSE 2
10
230 A$=MID$(A$,1,X-1)+MID$(A3$,2)+MID$(A
$,X+L2,L)
240 X=X+LEN(A3$)-1
250 IF MID$(A$,X,1)=" " THEN X=X+1:GOTO 250
260 IF MID$(A$,X,1)="," THEN X=X+1:GOTO 190
270 RETURN
```

PCM



# Snoop-Proof Your Memory!

By Richard T. Rogers

Passwording your Model 100 can keep unwanted snoops from gaining access to your privileged data.

I love my Model 100. Without getting into the prose of Shakespearean sonnets, I cannot count the ways. But if I had to pick a favorite feature, it is its ability to "telecommunicate."

My work involves travel, and I spend much time in airports, strange hotels, and even stranger cities. Before leaving on a trip, I load up all the "local" telephone numbers for the communication nodes in the places I will be visiting. I put these numbers in my ADRS.DO file . . . and thereafter "punching in" is simply a one button exercise. I check into three on-line data bases daily, and the Model 100's ability to remember phone numbers, passwords, and log-on procedures is wonderful; it is *also* the source of my primary concern about the machine. In what must be a corpo-

rate oversight, Tandy forgot to put any kind of security on this marvelous box. As a result, *anyone* who gets their hands on my machine (or yours) can get at everything in the machine . . . including my passwords, ID numbers, and other "keys" to some pretty expensive (and/or privileged) stuff. At the moment this really isn't much of a problem since very few people today know how to turn on the Model 100, and even fewer appreciate the nuance of telecommunicating. But while the chances of somebody stealing and using this information are remote, the consequences are sizeable (one of my data bases charges \$350 an hour!).

As smart as the Model 100 is, there *must* be some way to take care of this problem . . . and there is! Why not teach the Model 100 to protect itself from snoops? It can be done with a very sim-

ple one line BASIC program. And here it is:

```
1 IF INKEY$="z" THEN MENU ELSE  
POWEROFF, RESUME: GOTO 1
```

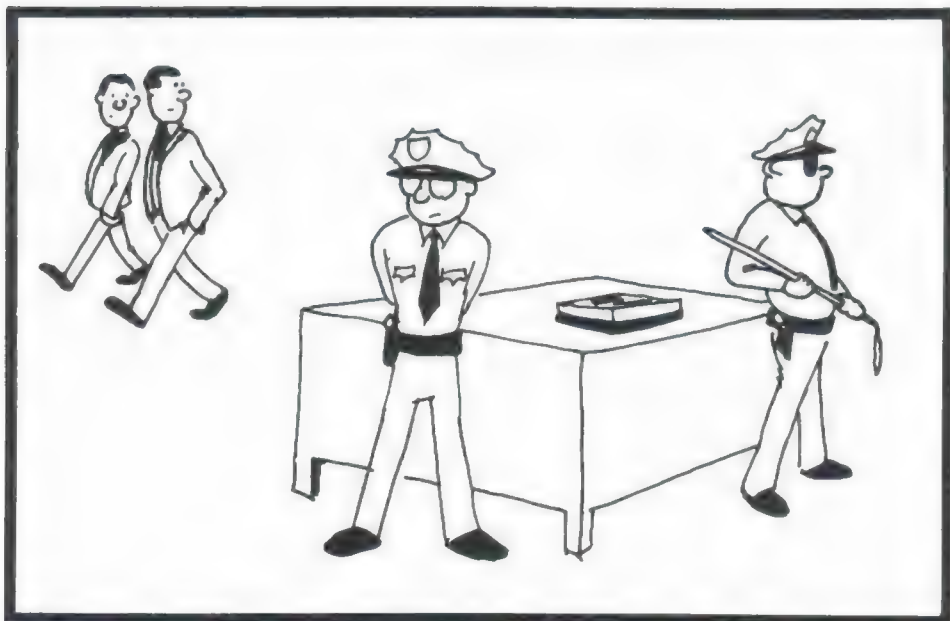
or, the less memory-efficient but more readable:

```
1 IF INKEY$ = "z" THEN MENU  
ELSE POWEROFF, RESUME: GO  
TO 1
```

(I suggest you SAVE this program to memory under the name of Z.BA . . . do this with a SAVE "Z" command.)

All this program does is check the keyboard on power-up to see if the operator is holding down the "z" key (ie, the *lowercase* "z," not "Z"). If this key is being depressed, the program branches to the MENU at which point the operator can run the Model 100 in an unrestricted fashion. But if the "z" key is *not* being depressed when this program runs, the machine automatically shuts itself off.

This software driven power-down process is a little unusual, however. Notice that the POWEROFF statement is followed by a RESUME. If you check your BASIC Reference Manual, you will find that the Model 100 continues to hold your BASIC program even after POWEROFF, and when you turn the power back on, the machine continues to run whatever part of the program follows the RESUME statement (in this case, the GOTO 1 statement). In other words, the next time you turn on the machine it will *not* display the typical MENU. Instead, it will continue running your little BASIC program, and immediately executes the GOTO state-





ment which causes the same one line program to run again. This, in programming terms, is called a loop. The result now is that the program once again checks to see if the "z" key has been depressed and, if not, shuts off the machine once again.

So far, we have taught our machine to turn itself off (under appropriate circumstances). We have done this with a BASIC program which contains one conditional branching statement (an IF/THEN statement). And by now some of you are surely asking what happens if a knowledgeable snoop gets into our machine, suspects what is going on, and attempts to power-up with the BREAK key depressed?

IF you understand BASIC programming, the answer is obvious. You will interrupt the program in mid-step before the program has the opportunity to execute the POWEROFF command. In other words, your snoop will get control of your system, be able to leave the BASIC program and proceed through your MENU with aplomb. In short, all your passwording efforts have failed you. Is there anything that can be done about this? Or, putting it another way, is there some way to disable the BREAK key?

After several inquiries to Tandy Center, self-appointed gurus, various special interest groups (SIGS) on CompuServe, etc., I finally discovered how to do this. I have not bothered to discover why or even how this works but I have found a way to disable the BREAK key. It is another simple BASIC statement which is:

```
POKE 63056,128
```

Anything you turn off you also want to turn on . . . and so the command to re-activate the BREAK key is:

```
POKE 63056,0
```

Try this little routine a few times to see if it works. Once satisfied that it does, RUN and *next* run the Password program. Now try running the password program and interrupting the Z.BA program's execution by holding down the BREAK key when you turn the machine back on again. It doesn't work, does it? Now, just to be certain, go ahead and turn the machine back on with the "z" key depressed . . . you are back to the MENU now, aren't you? One problem now is that your BREAK key is still disabled. There's got to be some way to put the system back "where it belongs" if the user successfully passes

the "password" hurdle. The way to do this, of course, is to restore the BREAK key just before calling the MENU program.

Putting all this together yields two programs, not one. Here they are:

```
[OFF.BA]
```

```
1 POKE63056,128:RUN"Z
```

```
[Z.BA]
```

```
1 IFINKEY$="z"THENPOKE63056,0:  
MENUELSEPOWEROFF,RESUME:  
GOTO1
```

Now when you turn off the system, simply RUN the OFF.BA program which is shown on the MENU. This will first disable the BREAK key and then run the password program itself. If you are not pressing the "z" key when you start this chain of events (and you normally wouldn't be doing this), the machine will turn itself off and will be standing-by to re-run the Z.BA program whenever the power switch is turned on again.

As far as I know, the only way to crack this system is to hold *both* the BREAK key and the RESET button (on the back edge of Model 100) while you turn on the computer. Release the RESET button while continuing to depress the BREAK key and you should (but no guarantees) interrupt the Z.BA program. After trying to crack open this system a few times, I should report to you that you are just as likely to make the whole machine lock-up tight, a not totally undesirable result if you think about it (the only person likely to be trying these convolutions is someone who doesn't know your password anyway).

While on this subject, please remember that turning on the machine with the CTRL and PAUSE keys depressed will eradicate ALL your Model 100's memory (including the OFF.BA and Z.BA programs themselves). Again, you may be in trouble if someone does this to your machine; but in these circumstances, a complete memory wipe-out may be preferable to saving the system intact for someone else to mess with!

One final note. Remember that the OFF program only works if you turn off the machine by running this program. What happens if you power down without running your security system? Obviously, the machine goes to sleep without any password protection program in it, and then you are back to a completely unsecured system. Obviously, if you want full password protection, you should *only* exit a session on the Model

100 by running the OFF.BA program.

There is, however, one other thing you can do to help avoid the consequences of your absent-mindedness (i.e., the failure to follow this simple turn-off process). This method is to make the OFF.BA program run automatically whenever the machine is turned on. You may do this by establishing OFF.BA as an IPL file.

IPL stands for Initial Program Load; it is an instruction which the machine carries in its memory and executes whenever the Model 100 is turned off while running any "applications" program . . . and then is turned back on again. To invoke this function, simply enter (from BASIC).

```
IPL "OFF.BA"<ENTER>
```

Now, if you turn off the machine while using the BASIC interpreter—and then turn it back on again—MENU will briefly appear on the screen and then the machine will suddenly turn itself off. Accordingly, the IPL "OFF.BA" command makes the system almost fool-proof (but not quite).

The IPL system *only* executes if you turn off the machine *while running an applications program* (eg, TELCOM, a text file, BASIC, etc.). If, perchance, you return to the machine's main MENU and *then* turn off the machine using the switch on its side, the Model 100 will not thereafter execute the IPL instruction. In short, the IPL system, when used with the password program, will prevent you from most—but not all—of your oversights. Until I find some way around this, you will just have to learn *not* to turn off the machine using the manual switch whenever the MENU is being displayed.

This discussion of passwording has somehow slipped into a tutorial on BASIC programming. To those of you who have no interest in BASIC, I apologize. Your salvation is simply to type in the programs, follow the rest of the instructions, and don't bother with worrying about exactly how or why all this password stuff works. But for those of you who *are* interested in writing your own Model 100 programs, perhaps you've learned something new. This may be your first exposure to the POWER-OFF, RESUME, IPL and POKE commands. Fear not; they're not unfathomable. And for those of you who already understand BASIC programming, well, you've probably already thought of several changes and embellishments to this program you wish to make. Go to it!

PCM



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# Reviews

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## HARDWARE

### Bi-Tech Bar Code Reader—The Emerging Technology

First, the product supplied was in its final hardware form, but the software was not. BT President Thomas Vandestouwe says the main holdup is getting the accuracy up to speed. He told me the software supplied for this review has a substitution-free "first read rate" of only 87 percent while the industry standard is 99 percent—and he won't ship any units for sale until the software "loops" are tightened up. Keeping that in mind, here's what I found . . .

The hardware is simplicity itself: just press the trapezoid-shaped plug into the BCR socket. The wand is easy to use and comes equipped with a power-saving wide-bar switch so you can turn the reader on only when actually scanning 3 of 9 code. Once I got the bar-reading program and its machine-language routine loaded from cassette, the wand worked the first time I tried it. A black outline appears around the screen and the words "Scan bar code" appeared. Following advice in the scanty directions to zip over the bar codes like "striking a match" produced the most reliable results. If you stray from the bar code or don't zip over the bar codes at the right speed, the Model 100 beeps and flashes "Error." But there's the rub—sometimes I'd get a "\*" appearing where a letter or number was supposed to be and not an error message. A couple of times complete garbage would appear. This is a software problem that must be solved. Documentation is vitally important, and was lacking in this pre-production sample . . . I got the Epson HX-20 manual, but it had mostly general information and specifications—not the user-friendly instructions I'd hoped for. Warning: I tried to run the Bar-reading program before calling the company for directions and learned a real lesson: never run a program you're unsure about. Because I neglected to enter the machine-code program that accompanied BAREAD, I totally wiped out my memory—BK address book and

all. Also, once the program starts running, provisions were not made to "break"—in fact, the entire keyboard was disabled so I had to hit Reset to get back to the main menu. This is typical of bar code reading programs I'm told—the machine language has to be so fast, it ignores all other inputs. Anyway, BT is working on it.

Another product from BT Enterprises was a separate program to print 3 of 9 bar codes with a Radio Shack series DMP printer. It was written by a former Tandy quality assurance specialist for the Model 100 project, Joey Rodrigue, now living in Hot Springs, Arkansas. BT intends to sell his program for \$29.95—a price low enough to combat the scourge of copying that plagues software authors.

Menus prompt you for title and header, and in seconds you see bar code appearing on paper, finishing up with the text in human-readable letters and numbers right underneath. Although no documentation was supplied with this prototype, I had it up and running easily because the program only requires you to type in what you want bar-coded. The program worked just fine on a DMP 200 or 500, but my DMP-120 was balky. Instead of printing (in condensed mode) one thin line of bar code and then returning the carriage with a partial line feed for another pass to make the bars taller, my printer would "wrap around" the repeats—leaving me with six thin versions instead of one thick one. I phoned the author about the bug, and he had it corrected within 24 hours by making three simple changes and it works perfectly. However, the bar-reading software isn't quite a perfect match yet, because of the fact that upon reading verified code back through the BT wand, I'd get errors like a "/D" instead of a "\$" sign—again blamed on the pre-production reader software.

Overall, the bar-code wand hardware is magnificent: well designed, easy to handle, and lightweight but rugged. It also looks quite similar to the one Radio Shack is introducing—and I'd speculate we'll see the same "HP" logo (Hewlett Packard) on the business end if the replaceable tip is unscrewed. The bar-reading software is another story—for bar codes to catch on, they'll have to be just as accurate an input as a cassette

machine. This version had accuracy troubles, and will have to be finalized. The bar-code printing software is a real bargain, and though it's "3 of 9 code" only, it represents an excellent way to get started in bar codes.

(Model 100 Bar Code Reader from Bi-Tech Enterprises, Bohemia, NY, \$279, and Bi-Tech Barprinting program for Radio Shack DMP printers, \$29.95)

—Jim Hawk

## SOFTWARE

### Data+ and Sort2+ A Database System For the M100

The Portable Computer support Group has released *DATA+* and *SORT2+*, two additional programs in their series of business related software for the Model 100. According to their advertisement in *PCM*, *DATA+* and *SORT2+* are now stand-alone enhancements of the programs *PUT+* and *SORT+*, both part of the *Businesspak+* series (*PCM*, August 1983). *DATA+* makes the Model 100 a true database which has full editing and printing features and the capability of creating "form" letters when used with *PCSG's WRITE+*. *SORT2+* is an expanded version of *SORT+* with lower memory requirements and better sorting routines.

#### *DATA+*

The software is furnished on tape enclosed in an 8½" x 11" attractive binder containing 45 pages of excellent documentation. Three programs, an address file, a BASIC program and a machine language program, must be loaded from tape to use *DATA+*. Two additional programs are available for creating note files and inventory files. The loading instructions are very clear and *DATA+* uses a little less than 7K of memory. Though the manual does not say, 24K of memory will be required for easy operation of *DATA+*.

The step-by-step documentation shows you how to easily use the address file feature of *DATA+*. When the



*P+ADRS* program is used, an address label format file is created and appears on the screen ready to be filled with data. Prompts are shown for each field which consists of first and last name, company, street, city, state, ZIP code, phone number, and two useful features, a memo space, and a code section. All are displayed on the screen together in a nice arrangement using inverse video to show the length of each field. When you have entered the data, F3 saves it automatically to the file. The files created are compatible with the built-in programs of the Model 100. If you wish to use the auto-dial feature of the Model 100, the manual reminds you to put "" in front of the phone number. If the prepared formatted screen is not satisfactory for your use, custom formats are prepared and saved easily. Up to 16 fields are supported, but you are limited to screens of 40 x 8.

What can you do with the *DATA+* files you have created? You can review the files easily using the F1 key to either selectively or sequentially move through the file. The file can be edited anytime simply by erasing the field using the ESC key and entering the new data, or deleting and adding only those characters to be changed, remembering to save each modified file with the F3 key. The files can be printed out to your printer, another file, or to tape. You can select the fields to be printed, and in which order or sequence, and which data or record from the files to print. The printer fields can be set according to margin desired and number of lines, which is especially useful for using the data files for addressing form letters. The files can be compactly printed which allows the unnecessary spaces between the fields to be deleted.

*DATA+* will also merge any information from any record file that was created with *DATA+* into any text prepared from a text writer such as PCSG's *WRITE+*. The caret symbol (>) and the field number allow for inserting into text any of the field data information from a designated record, thereby creating customized forms and reports. This feature alone is worth the price if you have standardized letters or forms which require data to be changed for each letter. The *DATA+* files are not limited to just address labels; with the capability of creating your own formats, such items as scientific reports, recipes, inventory lists, and personal notes can all be put into a form type letter. Even cus-

tomized "junk mail" reports with addresses and the body content changed can be effectively created.

#### ***SORT2+***

*DATA+* created files can be rapidly sorted using *SORT2+*, a 1K program loaded from cassette tape. After entering *SORT2+*, you are prompted for the file you wish to sort and then the field you wish to sort. Quickly and accurately the file is sorted either alphabetically or numerically and in all uppercase fold, or uppercase ahead of lowercase. The records must be of the same length. One very interesting feature of *SORT2+* is that it will sort all numbers into the proper sequence regardless of how many spaces it has. No more numbers have to be entered as 00001. My church's mailing list, which included birthdates of all the members (over 100) took seconds to sort all the birthdays by month and day.

Both *DATA+* and *SORT2+* are excellent programs for the businessman, manager, writer, and executive who desires a well-organized and efficient database program for the Model 100. *DATA+* and *SORT2+* should be sold as a package, as the *SORT2+* program is almost a necessity for handling large data files.

(Portable Computer Support Group,  
11035 Harry Hines Blvd., No. 207,  
Dallas, TX 75229. *DATA+* \$59.95;  
*SORT2+* \$29.95)

—Vincent Lord

## **SOFTWARE**

### *QuickPlot* Provides Powerful Business Graphics

Computer Solutions Company has recently released the *QuickPlot/100* version for the Model 100 with a minimum of 24K. *QuickPlot* has been available for other TRS-80 and IBM-PC computers for several months. What *QuickPlot* can do is to rapidly plot bar charts, line charts, and very interesting pie charts. The package includes a 25-page documentation booklet with copies of sample charts and a cassette with the programs on the first side and sample formats and data on the flip side.

*QuickPlot* is a business graphic package for the Model 100 and requires Radio Shack's CGP-115 to plot the charts. The manual assumes you know

very little about the operation of the computer and plotter and thereby makes the program exceptionally well suited for the businessman concerned with results and not programming techniques. The manual starts with the connections necessary for the plotter, a listing of the programs on the first side of the tape in order, and very detailed instructions on how to effectively load and use the software. To operate all the programs you must have the program "START," which is the menu driver, and the respective programs for the pie charts (FPIE and PPIE), bar charts (FBAR, DBAR, and PBAR), and line charts (FLINE, DLINE, and PLINE). The first character of each name gives the function of the program: F is format, D is data, and P is plot. The manual cautions to put into memory only one chart's programs at a time. One of the reasons is that START checks to see which programs are present in memory and auto-runs. The second reason is memory size. The pie chart programs consume approximately 9K of memory without data and variable storage requirements. The bar chart programs are 15K while the line charts with 32 data points will leave just enough overhead to run. Before loading any of the programs, clean house, including all XXX.DO files.

The documentation is quite good as it steps you through each format and data entry program necessary for plotting. One error in the text (corrected in later copies) is on Page 21, pie charting. PLINE should be PPIE. Once the proper programs are loaded, the screen will prompt you for 1) Create or Edit the format of the chart, 2) Create or Edit the data for the chart, 3) Plot, and 4) End. The formatting for the chart should be done first. After selecting "1" a second menu will appear asking whether you want to create, edit, plot, save, or return to menu. The first time, CREATE is the proper choice. Creating the format requires that you answer 16 to 18 blocks of questions about how you want the graph to look, including titles, grouping of the data, keys to the plots and their locations, and line or bar colors. In addition, you can set the tick marks on both the X and Y axes, set the numerical range for each axis, and have at your option an overlay grid. Each formatted file is saved automatically when you enter the four-character file name. The software will add a two-character suffix to identify the file as a formatted file for the respective chart, ie XXXXFL.DO is



the formatted file for the line graph. If you make a mistake entering the format parameters or find that the graph needs to be changed after the plot is run, simply ask for EDIT on the second menu. After editing is completed, the file must be saved to upgrade the formatted file.

After the format is established, the data file is created. Here you are prompted to exceed the limits of the upper X and Y coordinates you formatted. After the data file is created, as with the format files, editing is possible using the same techniques as for editing format files. At this point you are ready to try a plot. On the first try, I was able to make a beautiful pie chart of my son's expenses. The computer plotted the percentages, gave labels to the different slices, colored each slice with two colors, and offset one slice. The pie charts will take approximately five minutes or more depending upon the number of sections you require as the manual points out. (It suggests taking a coffee break, or maybe a short vacation.) The line charts, the

first time, caused a slight problem in the memory overflow area. I tried to enter too many data points, but soon came up with a nice chart showing high temperatures for Louisville and Mankato, Minnesota. The line charts require only a couple of minutes. The bar graph operation went as well as the pie chart. The bar chart speed depends upon the number of groups and the subsets in each group.

The manual includes several technical notes in the back that perhaps should be read before formatting or entering data. Information on changing the number of data points, entering months for the X axis labels, and how to solve the out of memory problem with more than 32 points in the line chart programs are all detailed.

The sample programs contained on the flip side of the tape are very visual and really show how *QuickPlot* performs. Spending a moment or two with the examples is strongly suggested if for no other reason than to observe the tremendous power of *QuickPlot*. By

using the editing feature you can step through the data and formatting used in the examples. There is one quirk that could be easily changed; that is, to put the sample data in the same order as the BASIC programs on the first side. The pie chart programs are first on the first side, but the pie chart sample data are last on the flip side.

If you have access to another TRS-80 compue data files can be downloaded for use where more memory is required. This ability is really appreciated if you are gathering data out in the field and you run out of memory.

If you need to do graphs and charts for your business or personal use, Computer Solutions has a best buy in *QuickPlot* with very crisp looking plots and user-friendly software.

(Computer Solutions Company, 901  
Embassy Square Boulevard, Louis-  
ville, KY 40299, \$49)

—Willis Rollins

(continued from Page 5)

Let's look at the concept in terms of the "word processor" you got with the 100. For the purpose of taking notes, writing short memos and the like, it is a nice little system. Not too complicated, a few very good features (especially cut and paste) but something a lot less than the two full-blown word processors which are now available from third party vendors.

What concerns me is that this "bundling" of software can have the effect of "chilling" the third party market for other programs. If you would like to compare two systems in another field, I think the reason for the success of the TRS-80 Color Computer and the lack of success of the TI-99 is simply the ease which third party vendors have had in breaking into the CoCo market. TI fought them; Tandy didn't. And look where the Color Computer is today as compared to the TI. One is riding high, the other is down the drain.

For the most part, "bundled" software will not be the best — simply because it is free. Someone who is selling something for value will be able to do more with his product than someone who doesn't. But I am concerned by the people who will not write word processors or database managers for the Portable Computer, simply because they think you already own one when you buy the machine.

While Radio Shack has some excellent programs available for the Portable — and more to come — there are a lot of excellent programs out there to be written. And these are the programs which will make the PoCo market an extremely viable one in the months ahead. I've always felt good about Tandy's willingness to allow the third party market to work for it. And I think this will again be one more mark of success for this computer system.

For that matter, so long as we are peering into the 1984 crystal ball, one of the areas that I see expanding for the Portable in the next year is in specialty programs. We all know that Tandy needs to be certain that there will be some

sure market for anything they publish, so their market tends to be horizontal, as far as software is concerned. But I see a great market for vertical software — construction estimating, stamp collecting databases, airplane navigation and the like. Tandy often sees these markets as too narrow for their marketing efforts — but they are certainly wide enough for many of you to employ your own expertise and a little programming ability to find a nice niche in the "computer business."

Finally, it would be inappropriate to close this message without saying thank you for your support for *PCM* in 1983. We look forward to working for and with you in 1984, and we wish you a happy, healthy and prosperous New Year.

Lonnie Falk

## Back Issue Availability

All back issues sell for the single issue cover price of \$3. In addition, there is a \$1.50 charge *per issue* for postage and handling within the United States, Canada and Mexico.

VISA, MasterCard, and American Express accepted. Kentucky residents please add 5 percent state sales tax.

## Correction

Dale Wheeler has brought to our attention an omission in his "Label Maker" program which appeared in our November issue. A GOSUB was left out of Line 32 in Listing 2 (for parallel printers). The correct line follows.

```
32 FORZ=1 TO 4: E$=C$(Z)+SPACE$(40-LEN(C$(Z)))
+D$(Z): LPRINT E$; CHR$(13);: CL=CL+1: NEXT
Z: LPRINT CHR$(13); CHR$(13);: CL=CL+2: IF CL
=>55 THEN GOSUB 38: GOSUB 18: GOTO 36 ELSE 36
```



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## New Products

### M100 Briefcase

Switch & Mux, Inc., of Merrimack, NH, has just released a new briefcase designed for the Model 100.

The briefcase is made of aluminum with a vinyl covering and has a three-position combination lock. Inside the base of the briefcase there's a felt-covered foam insert which has cutouts for the Model 100, cassette recorder, AC line adapter, acoustic coupler, and a Ni/Cad battery charger. The cover assembly contains flaps for documents, microphone and special holders for four extra Ni/Cad batteries.

The package includes the briefcase, foam insert, four Ni/Cad batteries and battery charger. The case is 21" x 15" x 4", weighs approximately six pounds and retails for \$135.

For more information, contact Switch & Mux, Inc., 10 Oakridge Ave., Merrimack, NH 03054, or phone (603)424-4161.



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